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PSYCHOANALYSIS AND THE UNITY OF SCIENCE

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Psychoanalysis and the Unity of Science *

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1. THE BROADENING OF OPERATIONISM

Freud's first formulations of his ideas in the sphere of personality aroused a clamor of protest which has never entirely subsided. More recently, however, we may observe a shift in the type of criticism levelled against psychoanalysis. Once the initial shock ensuing from Freud's discoveries had been overcome, scientists were in a better position to look at the structure of the theory of personality proposed by psychoanalysis, and the more recent scrutinies of the system appear to be concerned to a greater extent with its formal or methodological characteristics than with its content. Thus we hear that the method employed by psychoanalysis is a subjective rather than an objective one; that hypotheses and facts are often confused; that the psychoanalytic propositions do not lend themselves to scientific verification; that concepts like superego, ego and id are foisted on us as entities in a manner characteristic of the pre-scientific stages of inquiry and formulation; that many of the attempts to verify psychoanalytic assumptions have actually failed.

* Some of the contentions of this paper were first presented at the Symposium on the Experimental Approach to Psychoanalytic Theory held at the Meeting of the American Psychological Association in 1950, and also at seminar meetings in the Universities of California, Chicago and Michigan in 1951 and 1952. Some of the theoretical parts of the paper in its present version were read at the Berkeley Conference for the Unity of Science, July 1953, and at the San Francisco Psychoanalytic Society.

The philosophical arguments brought forth in this paper derive from some of the teachings of logical positivism. The writer is indebted primarily to her teacher in the philosophy of science, Moritz Schlick, in whose seminars and discussion groups she participated during and after her studies at the University of Vienna. In effect, this paper constitutes a return to an assignment, suggested to the writer some twenty years ago by the late Otto Neurath, to clarify the standing of psychoanalysis in the framework of the Unity of Science movement inaugurated by him at that time.

The common theme of these charges seems to be a dissatisfaction concerning the relationship between concept and fact, or between theory and observation, in psychoanalytic theory. We are not suggesting that all of these strictures are unjustified. Before examining concept formation as it occurs in psychoanalysis and existing attempts at confirmation of psychoanalytic hypotheses, we should, however, first like to recall, in a more general way, some of the more recent teachings concerning the relation between theory and observation. We should like to show that some — though by no means all — of the criticisms raised against psychoanalysis are based on misconceptions about this relationship. Many of the objections against psychoanalysis have their origin in an overly narrow interpretation of the version of scientific empiricism commonly known as operationism with its stress on the rooting of all concepts in concrete manipulations and observations (11, for a summary of psychological applications see 67), and generally in a vaguely anti-theoretical attitude, rather than in a legitimate criticism of psychoanalytic theory. This holds especially for the criticism originating in psychology proper.

As operationism is an offshoot of some considerations in physics, many critics of psychoanalysis explicitly point to the physical sciences as providing an ideal model for the formulation of theory, psychoanalytic or otherwise. However, this is in most cases done without full realization of the extent of certain changes in the conception of theoretical structure which have taken place in the field of physics itself. These developments in physics made it necessary to modify the requirements stated in the older forms of empiricism and positivism. Thus Einstein (20) does not demand that all abstract terms of science should be interpreted in terms of sense observation, and he designates as "structural" those elements of a theory which deal only with the relationship between the symbols.

In order that thinking might not degenerate into metaphysics or into empty talk, it is only necessary that enough propositions of the conceptual system be firmly enough connected with sensory experiences.

It was Schlick (60) who as early as 1920 stressed the departure from the phenomenally given as one of the foremost accomplish-

ments of Einstein's theory. Schlick emphasized the importance of both "observational" and "auxiliary" concepts such as electric forces. Since the latter are also measurable, he was at that time even inclined to consider them to be as "real" as colors and tones. He changed his position later, however. At the present time we witness a return to Schlick's critical realism (61) within the movement of logical positivism, notably by Feigl (23). Instead of the phenotypical approach we now acknowledge what Philipp Frank (26) has labeled the non-pictorial type of theorizing. The inability of our imagination to follow the notions of a four-dimensional space is only one of the most trivial examples of this. Frank points out that the earlier ultra-positivistic requirement, according to which all principles of physics should be formulated by using only observable quantities, has been replaced by a weaker requirement; now it is merely postulated that from these principles mathematical conclusions could be drawn that would be connected by semantic rules with statements about observable facts. Einstein speaks of

the ever-widening logical gap between basic concepts and laws, on the one hand, and the consequences to be correlated with our experiences, on the other.

Along similar lines move Hempel's (44) formulations concerning the necessary revisions of operationism and empiricism:

But it is precisely those fictitious concepts rather than those fully definable by observables which enable science to interpret and organize the data of direct observation by means of a coherent system which permits explanation and prediction.

There is increasing realization of the fact that scientific theories are the product of our imagination even though the system must have a rooting in observable fact and experience remains the ultimate and sole criterion of its adequacy. Different levels of description and theory can be defined by the closeness of the concept to, or their remoteness from, observable facts. Hempel gives a vivid description of the relationship between a scientific theory and the observational data.

The whole system floats, as it were, above the plane of observation and is anchored to it by rules of interpre-

tation. These might be viewed as strings which are not part of the network but link certain points of the latter with specific places in the plane of observation. By virtue of those interpretive connections, the network can function as a scientific theory: from certain observational data, we may ascend, via an interpretive string, to some point in the theoretical network, thence proceed, via definitions and hypotheses, to other points from which another interpretive string permits a descent to the plane of observation.

A comparison between the developments in physics and the situation in psychoanalysis is certainly not in all respects justified. While we must grant to the psychoanalytic system many more elements of a truly scientific theory than most philosophers of science realize, it still remains true that psychoanalysis contains many metaphors, analogies, and confusions between constructs and facts of which it can and must in the end be rid.

However, some parallels between recent developments in physics and psychoanalysis can be pointed out, and these have implications upon the problem as to what are the requirements for a confirmation of psychoanalytic propositions. Modern physics and psychoanalysis have in common a turning away from the "natural" to a "fictitious" language. And the common result of this policy is that a wider and simpler network of interrelationships within observable data is ultimately being achieved. Freud has introduced a number of fictitious constructs, such as unconsciousness, *id*, *superego*, repression, death instinct, and so forth. Although we may grant that psychoanalysis, in trying to avoid the error of an overly descriptive, segmentary and specific approach, has sometimes fallen into the error of over-interpretation and of drawing far-reaching conclusions from fragmentary evidence, we still contend that at one point the jump into theory which Hempel advocates must be made. The fact that theoretical constructs of the kind mentioned above refer only indirectly, and not completely at that, to observable data must therefore not be made the basis of an objection against psychoanalysis as such. It would constitute a serious misunderstanding of scientific theory construction were we to go along with the all too frequent type of criticism of ficti-

tious constructs recently exemplified by Ellis (21) who, in referring to such concepts as id and superego, writes as follows:

Many professional workers will immediately object that while they have frequently come across sex-desires, guilt-feelings and conflicts in their patients, they have never had the pleasure of greeting an ego or superego.

At the same time we must stress that the links to the observational data must be specified. Freud started with rather specific observations concerning hysteria and repression of the sexual content in hysteria. While at the beginning of his psychoanalytic explorations Freud kept close to the data and introduced constructs which he needed more directly for description and explanation of his data, he later became more speculative. From these speculations he derived a number of theorems which he then tested in his clinical observations. Then he became speculative once more to an extent which may be considered controversial, as we shall see in our discussion of the death instinct.

2. THE CONCEPT OF THE UNCONSCIOUS

There are two aspects of psychoanalytic theory which must be held apart. The first is given by its formal aspects, that is, the way the constructs are defined and the relationship between the various concepts. The second consists in the problems of verification or confirmation of psychoanalytic statements. We will begin with a discussion of the way Freud himself introduced some of his crucial concepts and will concentrate on two of the most basic and at the same time most controversial, that of the unconscious and that of instinct. Later we will turn to an analysis of these concepts from the point of view of recent notions on scientific concept formation.

As far as the definition of basic concepts is concerned, many critics of psychoanalysis have objected to an alleged lack of sophistication in Freud concerning the philosophy of science, and to his tendency to "reify" his concepts. The quotations from Freud that follow are brought forth as evidence to the contrary. They are to demonstrate how keenly aware Freud was of logical and epistemological problems, a fact often forgotten under the impact of the carelessness with which some of his followers use his terms.

About the function and nature of definitions in science, Freud has the following to say:

The view is often defended that sciences should be built up on clear and sharply defined basal concepts. In actual fact no science, not even the most exact, begins with such definitions. The true beginning of scientific activity consists rather in describing phenomena and then in proceeding to group, classify and correlate them. Even at the stage of description it is not possible to avoid applying certain abstract ideas to the material in hand, ideas derived from various sources and certainly not the fruit of the new experience only. Still more indispensable are such ideas — which will later become the basal concepts of the science — as the material is further elaborated. They must at first necessarily possess some measure of uncertainty; there can be no question of any clear delimitation of their content. So long as they remain in this condition, we come to an understanding about their meaning by repeated references to the material of observation. . . . Strictly speaking, they are in the nature of conventions; although everything depends on their being chosen in no arbitrary manner, but determined by the important relations they have to the empirical material — relations that we seem to divine before we can clearly recognize and demonstrate them. It is only after more searching investigation of the field in question that we are able to formulate with increased clarity the scientific concepts underlying it, and progressively so to modify these concepts that they become widely applicable and at the same time consistent logically. Then, indeed, it may be time to immure them in definitions. The progress of science, however, demands a certain elasticity even in these definitions. The science of physics furnishes an excellent illustration of the way in which even those 'basal concepts' that are firmly established in the form of definitions are constantly being altered in their content (34, p. 60f).

Freud further stresses the fact that we also make use of certain "complicated postulates" to guide us in dealing with psycho-

logical phenomena. Freud is aware of the fact that our observations are guided by explicit or implicit theoretical assumptions. Thus most clinical descriptions found in Freud employ the inferential construct of the unconscious. Freud proceeds from the common observation that an idea which is now present in consciousness may become absent in the next moment, and may become present again, after an interval, unchanged and from memory rather than as a result of a fresh sensory perception. It is this fact which leads Freud to the "supposition" that during the interval the conception has been present, although in a "latent" stage. In this he follows such famous precedent as that of Plato or Herbart. Freud argues that an unconscious conception is one of which we are not aware, but "the existence of which we are nevertheless ready to admit on account of other proofs or signs." (33, p. 22).

Among other things it is post-hypnotic suggestion which is brought forth as evidence for the importance of the distinction between conscious and unconscious. According to Freud no account of the post-hypnotic execution of an order, received during hypnosis and of which there is no recollection, can be given unless we assume a condition of latency, or of unconscious presence, of the command. Freud further points out that not all of the idea re-emerges into consciousness, but only the conception of the act to be executed.

From the standpoint of modern logic of science, there is nothing objectionable about the notion of latent or unconscious tendencies, at least not so long as we do not insist on assigning them to "the mind" in a metaphysical sense. A comparable situation obtains in physics when we observe that a physical object at one time exhibits magnetism — that is, when a piece of iron is present in its vicinity — and that it does not do so when this condition is not fulfilled. Magnetism thus is what Carnap (15) has called a "dispositional concept." The precise logical nature of concepts of this kind in relation to psychoanalysis will be taken up later. Suffice it to say here that such composite terms as unconscious hostility or dependency describe a disposition to display aggression or dependence under specified conditions, for example in therapy. We may remember in this context the definition of behavior given by Carnap at another occasion (16) which includes the just-mentioned processes with which psychoanalysis deals:

It must be made clear that the term behavior has a greater extension here than it tended to have with the early behaviorists. Here it is intended to designate not only overt behavior which can be observed externally but also internal behavior, that is, processes within the organism; in addition, it includes dispositions to behavior which may not be manifest in a given special case; and finally it includes certain effects of overt behavior upon the environment.

In addition to the post-hypnotic execution of hypnotic suggestions as a means of confirming unconscious factors as determinants of behavior, the transition of latent processes into manifest behavior may also be observed more directly in the psychoanalytic procedure. Freud considers the assumption of unconsciousness as necessary because the data of consciousness are "exceedingly defective." Conscious acts alone do not enable us to account for the parapraxes and dreams of healthy persons and of the mental symptoms or obsessions in the sick. Our most intimate daily experience introduces us "to sudden ideas of the source of which we are ignorant, and to results of mentation arrived at we know not how" (35, p. 99). All these conscious acts are said to remain disconnected and unintelligible if we are determined to hold fast to the claim that every single mental act performed within us must be consciously experienced. On the other hand, it is pointed out, they fall into a demonstrable connection if we interpolate the unconscious acts that we infer. The gain in meaning and connection is considered by Freud a perfectly justifiable motive, one which may well "carry us beyond the limitations of direct experience."

In the opinion of Freud it is the very assumption of unconscious processes which enables psychoanalysis to take its place as "a natural science like any other." He goes on to explain that these processes are "in themselves just as unknowable as those dealt with by other sciences such as physics and chemistry" (41). And Freud remains in the spirit of the natural sciences when he states that

it is possible to establish the laws which those processes obey and to follow over long and unbroken stretches their mutual relation and interdependences (41, p. 36).

The introduction of the term "unconsciousness" thus is done in the service of good scientific procedure and with explicit reference to its rules. The relationships between consciousness, preconsciousness and unconsciousness are described in detail by Freud, and he designates this field as the topographical aspect of psychoanalysis. Latent ideas which are capable of entering consciousness without any special resistance are called preconscious, while the term unconscious is reserved for ideas "with a certain dynamic character" which are kept "apart from consciousness in spite of their intensity and activity."

The concepts of conscious and unconscious thus emerge as signification of "particular systems and possessed of certain characteristics." Freud was keenly aware of the fact that he was building a formal model containing the different systems with a specification of the relationships between them. The following quotation shows how far he was from a reification of his concepts:

We might still attempt to avoid confusion by employing for the recognized mental systems certain arbitrarily chosen names which have no reference to consciousness. Only we should first have to justify the principles on which we distinguish the systems and we should not be able to ignore the question of consciousness, seeing that it forms the point of departure for all our investigations. Perhaps we may look for some assistance from the proposal to employ, at any rate in writing, the abbreviation Cs for consciousness and the Ucs for the unconscious when we are using the two words in the systematic sense (35, p. 105).

From then on Freud consistently used these symbols, as if to underscore the fact that they refer to mere abstractions. Freud further points to the fact that by the introduction of the different mental systems he has departed from the descriptive academic psychology and that the consideration of "mental topography," which means the indication "in respect of any given mental operation within what system or between what systems it runs its course," has won psychoanalysis the name of depth psychology.

Freud thus introduced the concept of the unconscious as an abstract, hypothetical construct (see the discussion later) which

is specified by its relationship to other concepts such as consciousness and preconsciousness and to which a partial empirical interpretation is given by reference to free associations, dreams, and occurrences during therapy. In order to establish the relationships to observational data, many subsidiary hypotheses such as those concerning the nature of the therapeutic process and of dreams are necessary. In his later writings, notably in *New Introductory Lectures* (39) and in *An Outline of Psychoanalysis* (41, p. 33f), Freud prefers to use the term "unconscious" as denoting mental qualities rather than systems, at the same time replacing it by the more obviously dispositional term "Id" for the major purposes of the theory.

We will no longer use the word unconscious in the sense of a system and to what we have hitherto called by that name we will give a better one which will not give rise to misunderstanding. We will call it henceforth the Id.

These and related formulations of Freud are in our opinion less lucid than the ones discussed before. The reason for Freud's proposal to shift from the interpretation of the unconscious as a "system" to that as a "mental" quality lies in his later discovery that not only the "Id" but also part of the "Superego" and "Ego" are often unconscious. In our opinion this discovery does not necessarily interfere with an interpretation of the unconscious as a system with specific dispositional characteristics. Incidentally, it may be helpful in the early stages of discovery to designate certain patterns of behavior in terms of special and relatively fixed classifications such as id, ego, and superego. Today many of the earlier statements of psychoanalysis may be reformulated in terms of behavioral patterns in such a manner that the facets of behavior connected with the biological processes are differentiated from those which are the result of cultural taboos.

There is no reason to assume that Freud's writings necessarily improved as time progressed. It is interesting to speculate as to whether Freud first felt the need of thinking of the unconscious as an abstract system, and then his increasing familiarity with the manifestations which were to be explained by the term once chosen made him view these attributes as mental qualities. In his

paper on "existential hypotheses," Feigl (23) has pointed out that at the beginning of a science it is often difficult to judge which concepts represent mere conventions and which refer to specific entities. Although Freud has never explicitly designated the concept of unconscious as a mere convention, in his above quoted interpretation of the unconscious as a system to be designated merely by letters or letter-combinations it seems to entail more conventionalist connotations than in his later writings. In view of Freud's original intent in introducing the concept of the unconscious, such criticism as the following by Ellis (21) seems unjustified:

It is now (thanks to Freud) a well established clinical fact that human beings have thoughts and feelings of which they are unaware or unconscious. But to collect the processes under the term unconscious, used as noun and implying a specific entity in itself, is more confusing than revealing.

In discussing the localization of mental processes, Freud points out that the objection may be raised that these latent recollections can no longer be described as mental processes but that they correspond to residues of somatic processes. Against this he holds that the conventional identification of the mental with the conscious is thoroughly unpractical since it forces us "prematurely to retire from the territory of psychological research without being able to offer us any compensation elsewhere." He concludes that we shall therefore be better advised to give prominence to "what we know with certainty of the nature of these debatable states" (35, p. 99ff).

Freud goes on to acknowledge that a "rough correlation of . . . the mental apparatus to anatomy . . . exists." But in his opinion every attempt to deduce from these facts a localization of mental processes has completely miscarried. He points to the "hiatus which at present cannot be filled, nor is it one of the tasks of psychology to fill it." Our mental topography, he concludes, has for the present nothing to do with anatomy; it is concerned not with anatomical locations, but with "regions in the mental apparatus" irrespective of their possible situation in the body. The fact that,

at least for the time being, a physiological interpretation of his concepts has not become possible is stressed by Freud again and again. While at the beginning Freud was intensely dominated by neurophysiological thinking, the decisive progress in psychoanalysis occurred not until after he freed himself from the search for such analogies and turned to more openly psychological models. However, Freud always considered this step as temporary and as necessitated by the present imperfect state of the biological sciences.

We cannot do more than give a few examples of the manysidedness of Freud's models. Thus Freud goes into great detail in discussing the fate of ideas and affects in terms of a "given volume of excitation," developing the point of view which he has called "economic." In an earlier paper Freud characterizes this energy as "something having all the attributes of a quantity although we possess no means of measuring it." He adopts Helmholtz's principle of conservation of energy. Siegfried Bernfeld (5) has amply pointed out Helmholtz's influence on Freud. The energy withdrawn from a conscious idea when it is repressed is used for an anti-cathexis of the same idea, which makes for keeping the idea out of consciousness. Freud uses the various formal relations between the different systems to give an explanation for the sub-varieties of repression occurring in hysteria, phobia, and other forms of neurosis. In the discussion of an animal phobia which constitutes a substitute for the hate of the father, Freud (35) compares the real fear of an animal with the neurotic one. The latter is "fed . . . from the springs of unconscious instinct" and is "obdurate and extravagant in the face of all influences brought to bear from the system Cs, . . . thereby betraying its origin in the system Ucs."

There are said to be several differentiating characteristics between the Ucs system and Cs system. The conscious ideas comprise the "concrete idea" plus the "verbal idea" corresponding to it. By linking the two, a higher form of organization can be achieved. The processes of the Ucs, on the other hand, are little related to reality. They are subject to the pleasure principle, and the external reality is substituted by an internal reality. There is exemption from mutual contradiction and the outcome depends mainly upon the degree of strength of these processes and upon the "degree of their regulation by pleasure and pain." Or, as Freud

says later, we deal here with mobile and unbound energies. The processes of this system are "not ordered temporally," are not altered by the passage of time. All these characteristics are grouped together under the heading of "primary processes." These are genetically succeeded by the "secondary processes" which occur within the *Cs* system. This latter system binds the primitive energies through reality-control.

The derivatives of the *Ucs* act especially through dreams and free association as intermediaries between the two systems. Closer study of the derivatives of the *Ucs* will altogether disappoint our expectations of a schematically clear division of the one mental system from the other. A good illustration of inferences from the "manifest" to the "latent" content is given by the following quotation on dream interpretations:

The dreamer's associations bring to light intermediate links which we can then insert in the gap between the two and with the help of which we can recover the latent material of the dream and "interpret" it. It is not to be wondered at that this work of interpretation (acting in a direction opposite to that of the dream-work) fails occasionally to find a completely certain conclusion (41, p. 54).

In defending all these complexities Freud stresses the aim of merely translating into theory the results of observation. He points out that there is no obligation to achieve at our very first attempt a theory that "commends itself by its simplicity, in which all is plain sailing." Freud argues that we must defend complexities of the theory so long as we find that they fit in with the results of observation; and we must not abandon our expectation of being guided in the end by those very complexities to recognition of "a state of affairs that is at once simple in itself and at the same time answers to all the complications of reality" (35, p. 122f). There is an obvious similarity between these and many of Freud's earlier quoted programmatic utterances, and those of logical empiricists; this adherence extends here to the postulate of simplicity and becomes even more pointed by the relegation of simple structure to a distant ideal state of affairs.

3. THE CONCEPT OF INSTINCT

Next to the concept of the unconscious it is that of instinct which has been objected to most vigorously in the face of claims of psychoanalysis for consideration as a science. According to Freud, the concept of instinct is a "conventional but still rather obscure" one. Considering mental life from a biological point of view, an instinct appears to Freud as both the "mental representative" of the stimuli emanating from within the organism and as a "measure of the demand made upon the energy of the latter in consequence of its connection with the body" (34, pp. 61, 64). Statements concerning animal drives like hunger or sex would not seem to require any special justification so long as they remain mere descriptive summaries of factual behavior. However, the further elaboration of the concept of instinct as representing a special kind of energy and a constancy principle for this energy, as well as the more specifically psychoanalytic doctrine of the far-reaching transformations and disguises, particularly of the sex instinct, renders the concept of instinct a much more involved one, leading Freud to the following simile:

The theory of the instincts is, as it were, our mythology. The instincts are mythical beings, superb in their indefiniteness. In our work we cannot for a moment overlook them, and yet we are never certain that we are seeing them clearly (39, p. 131).

There are several ways in which this statement may be interpreted. Freud may have had in mind that the concept of instinct is hypothetical in spite of the fact that we are aware of some of the instinctual impulses. In this case the term "mythology" may be misleading. What Freud probably had in mind over and beyond the interpretation just given is the lack of knowledge about the basic biological processes which underlie the instincts, and consequently a certain lack of clarity in his own instinct theory. Although we must grant that this is true, we must add that the sections dealing with infantile sexuality and with the description of the psychosexual stages of development belong to the most lucid and most powerfully executed parts of Freud's system.

After differentiating and defining the "impetus," "object," "source," and "aim" of instincts, Freud undertakes to classify

the instincts, pointing out that there is "obviously a great opportunity here for arbitrary choice." In this enterprise we should not neglect to ask whether instinctual motives do not admit of further analysis in respect to their sources, so that only those primal instincts "which are not to be resolved further" could really lay claim to the name (34, p. 67).

Pursuing the psychological description, Freud summarizes the distinctive characteristics of instincts by pointing out that instincts have in a high degree the capacity to "act vicariously for one another" and that they can readily change their objects. Thus they are capable of activities widely removed from their original modes of attaining their aims, such as in "sublimation" (p. 69).

The very fact that the concept of instinct covers a wide variety of behavior and permits of many manifestations accounts for its explanatory value. Only if Freud would have ascribed to every variety of manifest behavior a corresponding instinct would he have rendered this concept superfluous and circular. Freud nonetheless expresses some doubt whether the psychological approach alone will afford any decisive indication for the distinction and classification of instincts. He himself has wavered in his classification of instincts. At first he differentiated the sex- from the ego-instincts (self-preservation). The ego-instincts include further all the counter-sexual forces such as guilt feelings, ethical ideals, etc. However, later, Freud viewed "egoism" or "narcissism" as of the same libidinal character as sex. He therefore gave up his original classification of instincts, and later he distinguished Eros and Death, in which process aggression acquired a primary status not further deducible.

The "death instinct" is Freud's perhaps most controversial speculation. It assumes that there is a basic tendency in living organisms as well as in inorganic systems towards self-destruction, reduction of tension, and Nirvana; in contrast to this, Eros represents initiative and hunger for stimulation. Even such an ardent follower of Freud as Fenichel (24) tends to the belief that the death instinct is a superfluous and far-fetched concept even in the explanation of such facts as depression, masochism and guilt-feelings. According to Fenichel, "external factors that disturbed the principles innate to the organism" could be adduced instead of a separate "genuine self-destructive instinct." However, definite

judgment on this matter should be postponed. Freud himself has stressed that much will depend on results of future biological research. Freud's own tentativeness concerning these assumptions is strikingly expressed in the following passages, showing, at the same time, once more Freud's astuteness in matters of the philosophy of science:

One may surely give oneself up to a line of thought, and following it up as far as it leads, simply out of scientific curiosity, or — if you prefer — as *advocatus diaboli*, without, however, making a pact with the devil about it. . . . At all events, there is no way of working out this idea except by combining facts with pure imagination many times in succession and thereby departing far from observation. We know that the final result becomes the more untrustworthy the oftener one does this in the course of building up a theory, but the precise degree of uncertainty is not ascertainable. One may have gone ignominiously astray (37, p. 190f).

A large part of psychoanalytic theory deals with the vicissitudes of the instincts and their transformations, such as reversal into the opposite, repression, and sublimation. These concepts do not pose the same logical questions as, for instance, the concept of the unconscious; they refer to interrelationships among facts and successions of patterns, all of which are more or less directly observable. But since these transformations include a very long span of time and permit of alternative manifestations, we soon get involved in problems of the methods of verification and confirmation; these we shall take up in later sections. Here we should like to give just an example of how Freud arrives at the assumption that such traits as exceptional orderliness, cleanliness, parsimony, and obstinacy, in adults, are related to anality and the process of bowel movement in early childhood, thus constituting aspects of the instinctual pattern of anal eroticism. Freud first observed the repeated coexistence of the traits mentioned and then turned to the history of the individuals who exhibited them. These were found to have been in the habit of refusing to empty the bowel, deriving an incidental pleasure from the act of defecation. Since these peculiarities tend to disappear once childhood has passed, the anal zone seems to have

lost its erotogenic significance; but the constant appearance of the traits listed may, according to Freud, be brought into relation with the disappearance of the anal erotism of the individuals concerned. Freud proceeds to show the theoretical relation between the trait-syndrome and activities related to the anal zone. The triad of cleanliness, orderliness, and reliability are said to give exactly the impression of a reaction-formation against an interest in things that are unclean and intrusive and ought not to be on the body. Freud refers to the saying, "Dirt is matter in the wrong place." He admits that to bring obstinacy into relation with interest in defecation seems no easy task, but points to the fact that infants can very early behave with great self-will about parting with their stools (32, p. 45). Freud introduces materials from ancient civilizations, myths, fairy tales, dreams and superstitions as a further means of verification of the anal theory by demonstrating that in these archaic modes of thought money comes into a close relationship with excrement.

The correlation between the three traits of cleanliness, orderliness, and obstinacy has been statistically confirmed by Sears (63). In the psychoanalytic system these empirical relations are not disconnected from such theoretical considerations as those on infantile sexuality and repression. Freud's scientific procedure can be illustrated once more by following him in his theoretical deduction of the observation that one may expect but little of the "anal character" in adults who have not repressed the erogenic quality of the anal zone, as for example certain homosexuals.

In addition to the evidence from genetic sequences and from symbolic materials like dreams and myths, Freud attempts to support the transformation of the original interest in excrement and dirt into a later interest in cleanliness and orderliness by referring to the occasional breaking through of the older attitude in spite of the fact that a reaction formation took place, and to the exaggeration of the new attitude which from the point of view of "economy" seems to indicate a struggle against a force in the opposite direction. An independent empirical study which has led me to a systematic inventory of criteria of this kind will be discussed below.

While Freud gave prominence to such physical activities as oral and anal ones and considered them as prototypes and models for

other types of activities, the Neo-Freudians consider these bodily activities as but one manifestation of broader social events. Only a large and presently unavailable body of data could help us choose between these alternative hypotheses. On the basis of the evidence accumulated thus far it would seem that although bodily events have a distinction of their own, they still are capable of being, and actually are, modified by the larger cultural contexts in which they obviously are embedded.

The material discussed in this and the preceding section seems to warrant the conclusion that Freud was aware of the principal problems of theory construction and of the philosophy of science. On the whole he introduces his concepts very carefully, distinguishing what we now call the postulatory from the operational elements of the theory and allowing their interplay as he moves along. However, some more formal attempts in the direction of an axiomatization of the psychoanalytic system would be quite useful. We are not speaking here of a logical or quantitative formalization in the strict sense but merely of the more systematic differentiation between basic assumptions and their derivations. For example, a combination of the assumptions of infantile sexuality and of repression may be able to cover many of the more specific theorems in psychoanalysis. As we have seen, Freud himself has derived the concept of unconsciousness from his observations about repression. Such an attempt at a systematization of psychoanalysis would be helpful in uncovering the logical contradictions, empirical gaps, insufficient evidences, and related flaws inherent in the system. In spite of its suggestive character and in the main logically appropriate approach, psychoanalysis still remains in many aspects programmatic, as Freud himself has so often emphasized.

It must furthermore not be forgotten that Freud often talks in an abbreviated manner, for example when he speaks about the "existence of the unconscious" or when he uses such expressions as "the super-ego, or the ego" being such and such, or doing this and that. However, this manner of speech does not, as a rule, lead to serious consequences. Freud always continued to work on the improvement of his concepts and their relations to each other, and to check them against observational data. The two procedures are often combined in his writings, but mostly it is not difficult to discern which definitions are "syntactical" and which "semantical."

In spite of Freud's caution and his fine sense for scientific procedure, psychoanalytic theory remains vague in many places. Freud is aware of this fact; in one place he speaks of the "superb indefiniteness" of the term "instinct." But he tries to defend concepts of this kind when he says:

We can claim for them the same value as approximations as belongs to the corresponding intellectual scaffolding found in other natural sciences and we look forward to their being modified, corrected and more precisely determined as more experience is accumulated and sifted. So too it will be entirely in accordance with our expectations if the basic concepts and principles of the new science (instinct, nervous energy, etc.) remain for a considerable time no less indeterminate than those of the older sciences (force, mass, attraction, etc.) (41, p. 36).

In this context we may recall a statement made by Otto Neurath to the effect that "new ideas of scientific importance start mostly with vague and sometimes queer explanations," and we should heed his advice that "one can love exactness and nevertheless consciously tolerate a certain amount of vagueness" (55, p. 21), an advice which he apparently considers necessary to give to an empiricist.

Pointing to the frequent use of analogies, many critics of Freud feel, and not entirely without justification, that Freud at times exceeded the legitimate degree of vagueness. Freud himself thinks that some of the difficulties in his speculations concerning the life and death instincts come from our being obliged to operate with "metaphorical expressions peculiar to psychology (or more correctly psychology of the deeper layers)."

Freud assumes that some of the shortcomings would disappear if for the psychological terms we could substitute "physiological or chemical" ones. Freud explicitly states that until then we have to deal with analogies, and that analogies "prove nothing." Their function is to make one "feel more at home" (39, p. 103).

We come here to perhaps the most serious objection which can be raised against the psychoanalytic system. This is given by the occasional use of analogies by Freud which seem to go distinctly beyond the heuristic stage. In discussing the unconscious, Freud

himself raises the question whether or not he is just dealing with animistic analogies. He points out that the psychoanalytic assumption of unconscious mental activity may be nothing but a further development of that primitive animism which caused our own consciousness to be reflected in all around us (35, p. 104). After some further deliberation, however, Freud rejects his own objection, and we must agree with him as far as the particular case in question is concerned.

There also are many mechanistic analogies in Freud, although these are mostly used for the explicit purpose of stating mere formal similarities. One becomes impressed by the carefulness with which Freud avoids an over-simplified and uncritical dualistic psychophysical parallelism. He speaks of the "insoluble difficulties" of psychophysical parallelism, or of interactionism for that matter, and often prefers to talk about the psychological vs. the physiological "language," or about physiology as slated some day to supersede psychology, rather than about causal relationships between two metaphysically distinct systems.

While the analogical procedure is not suited for purposes of ultimately proving a scientific hypothesis, it must be stressed that the function of analogy is more important in psychology than it is in physics. In physics pictorial types of relationships are available as an important heuristic guide prior to the establishment of abstractly and objectively defined terms used in theory construction. In the early stages of scientific theory construction, such as we are witnessing in psychoanalysis, in which the abstract terms are not yet fully defined, the analogy plays an important role in the discovery and communication of relationships. Their use by Freud turned out to be extremely fruitful, perhaps because it was coupled with a sense of responsibility for scientific procedure which led to his being aware most of the time of the stage of scientific inquiry and testing in which he happened to be involved.

4. REMOTENESS FROM THE PHENOTYPE

Freud's turning away from the directly observable, obvious, face-value picture of personality and from its common-sense interpretation which is illustrated in his use of the concept of unconscious and of instinct is one of the most impressive and at the same time one of the most bewildering aspects of psychoanalytic theory.

This departure from the obvious, directly observed phenomenon which we shall now study in its relational aspects has taken two different forms. First, there is an attention for certain relationships which had remained largely unexplored before the advent of psychoanalysis. Observations of pathological states prompted Freud to explore infantile sexuality, dreams, the psychopathology of everyday life, the seemingly irrational types of symptoms, both normal and neurotic, and eventually fairy tales, myths, and works of art. All these unusual types of data were exposed by him to scientific inquiry. The second surprise element in Freud's approach lies in the unusual and unfamiliar interpretations which were given to familiar data of overt behavior. In either case certain forms of behavior were examined in a wider genetic and dynamic context and inferences drawn which went beyond — and often were in seeming contradiction to — the obvious gross characteristics of behavior. Sometimes these gross characteristics are called "phenotypical" in psychology, in a modified usage of the familiar biological term. The inferences concerned are in line with the departure from the immediate pictorial appearance in modern physics to which we have referred in the introductory section.

To many critics it has seemed disturbing that in certain psychoanalytic contexts extreme friendliness is interpreted as a sign of hostility, extreme tidiness as a sign of preoccupation with dirt, or extreme boredom as a sign of intense interest. However, this seeming discrepancy with observation does not mean that there is no set of specified conditions and rules which determine when friendliness is to be interpreted as friendliness and when as aggression. We will discuss those specifications in a moment. But we must anticipate there that it often turns out that if we draw our inferences from a greater variety of manifestations, using maximal as well as minimal cues, instead of taking verbalized statements or social techniques as directly valid, we arrive at a more fruitful and unified interpretation of personality which furnishes an improved basis for long-range predictions. We may go so far as to say that it is the very shift from the level of external, overt manifestation to the level of motivational dynamics which opens the way to a science of personality. This shift is altogether the merit of psychoanalysis.

In some previous discussion of psychoanalysis the present writer

(28) has suggested that it is primarily the interpretative extrapolation into a hypothetical central region that justifies the use of the label, depth psychology, as contrasted with the more conventional surface psychology which concentrates upon the directly accessible gross features of behavior or of experienced phenomena at their face value.

Scientific inference concerning central processes, that is, the assumption of internal states on the basis of external evidence, cannot be defended unless it is based on a wide variety of circumstantial evidence. In this sense central inference had never been truly attempted before psychoanalysis. Correspondingly psychoanalysis, especially in its beginnings, comparatively neglected not only the surface observations in their specific identity but also the so-called "distal achievements" — that is, end results — of behavior (28). As was pointed out by Egon Brunswik (13), the major objective criteria for units of action in psychology, such as those suggested by Albert P. Weiss, Hunter, Tolman, and Hull, are explicitly and implicitly based on a recognition of "vicarious functioning" of behavioral means relative to the same distal goal.

The approach of psychoanalysis shows important differences from this approach to behavior, both falling short of it and going beyond it. The regrouping of manifest observable facts was at least in the beginnings of psychoanalysis undertaken exclusively in terms of "cause" or "need" rather than in terms of "effect" (as would be the case in Tolman's purposive behaviorism, 68). Not only are there alternative manifestations to the same need in psychoanalysis, there even are alternative goals to the same need. The chief differentiating characteristic of psychoanalysis is to have pointed out sameness of cause rather than sameness of end. Thus the conscious or unconscious aspects of our reactions are not in the same way alternative as, for instance, running or swimming toward the same goal, to cite one of the experimental examples of Tolman. One may argue that if somebody gives up the goal of, say, playing with dirt, for, say, painting, still the same goal is perceived. Against this objection it could be pointed out that such sublimated activities as painting represent a scattering to essentially shifted forms of adjustment and behavioral effects in spite of their asserted relatedness, in a genetic manner, to the same primitive, instinctual tendencies.

In the discussion of Freudian theory, the influence of Darwin is usually stressed. Freud himself has made some remarks to this effect in his autobiography (40). This influence is certainly discernible as far as his theory of evolution is concerned. However, unlike that of Darwin, Freud's view and classification of behavior phenomena is not based on criteria of "adjustment."

In discussing the influence of Darwin on Freud, Bergmann (3) stresses as a positive feature the naturalistic approach and as negative what he calls the teleological aspects of the Freudian doctrine, that is, explanations from the point of view of a goal, such as survival. It will be remembered that we have taken the opposite stand, that is, that psychoanalytic explanations are oriented primarily toward causes rather than toward ends.

The relative absence of distal result reference, that is, of emphasis on fixed goals and environmental effects in Freud's theory which the writer has pointed out from the standpoint of academic psychology (28), has also been noted by some of Freud's most devoted intimates. Using somewhat different means of conceptualization, Anna Freud (31) has pointed out that at least in the more orthodox forms of psychoanalytic theory and diagnosis all efforts concentrate backward into "depth," that is, toward the common "historical" origin of the various manifestations. More recently, Suzanne Bernfeld (6) has related this predilection of Freud for "digging" into the past of the individual to his fondness for archaeology which she has shown to have been his only major hobby.

In defense of the depth-psychological type of approach it must be emphasized that the temporary abandonment of concern with the reaching of goals has turned out to be an eye-opener for all the vastly different manifestations which may be linked functionally to an assumed common drive. One of the most fruitful consequences of this seems to me to be that it now becomes possible to link the motivational patterns thus uncovered not only to gross features of behavior but also to minimal cues. It is crucial that neither the gross nor the subtle features are taken "at face value" in this process. One of the main advantages to be gained from the concept of drives would be lost if we would fail to transcend the straight description or direct categorization of behavior. Quite aside from the validity of the psychoanalytic inferences, one is

forced to recognize that they have shown a great resolving power in bringing together conceptually the most diverse varieties of apparently unrelated behavioral features.

The exclusive emphasis on manifest behavior and its further effects proved to be sterile both in the study of personality and in the earlier, static classificatory systems in psychiatry. It is to a large extent the fact that in our culture basic impulses must be disguised or transformed to pass individual and social censorship which makes it necessary to unearth the hidden themes of motivation. Academic psychology dealt chiefly with types of behavior in which there is more continuity all through the course of life, and was less concerned with the kind of behavior which gets drastically deflected and changes the basic form of manifestation as development proceeds.

In the majority of cases it is verbal behavior such as dreams, free associations, and the like, rather than overt motor behavior which psychoanalysis takes as the basis for drive interpretations. This does not mean that psychoanalysis is "introspectionistic," however. As everyone knows, it is precisely through psychoanalysis that we have learned to doubt the face value of introspection. In behaviorism we often find the tacit assumption that motor behavior is superior to verbal behavior as a validating criterion of constructs. This predilection for overt behavior as the final measure of validity is not justified. We can "lie" with gestures as well as we can with words, either deliberately or as a matter of unrecognized practice. If we observe the motor behavior of two individuals in their interaction we may be more misled as to their basic attitudes toward each other than if we study the verbal statements they make about each other.

However, the shift of emphasis from overt behavior to underlying dynamics was too radical in psychoanalysis. Even though it remains true that the variety of isolated behavioral manifestations is too diverse for scientific penetration, integration in terms of unorganized, instinctual dynamics alone is too universal an integration. While academic psychology and sociology tended to abstract only the gross features of behavior whenever they tried to cope with the unmanageable variety of behavioral manifestations, psychoanalysis did not altogether avoid the pitfall of motivational relativism and a genetic dissolution of overt adjustmental values.

Most of Freud's thoughts are concerned with the innate instinctual development, while the discussion of the modification of the instincts under the restrictions and disapproval of the environment takes a secondary place. Such widely different patterns of social adjustment as that of, say, a criminal and a lawyer, a "saint" and a sexual masochist, are not adequately differentiated from one another in terms of the psychoanalytic theory of instinct taken in and by itself. Although it is of utmost importance to become cognizant of what these socially so diametrically opposite patterns may have in common, the differences existing between them must also be accounted for in any full-fledged and behaviorally oriented theory of personality. The concept of "sublimation" adduced in psychoanalysis to explain the transformation of certain instinctual energies into socially accepted channels and goals remains vague and the conditions of this mechanism appear not to be fully specified in psychoanalytic theory. This shortcoming has been noted by some orthodox psychoanalytic theorists also.

In fairness to Freud it must be stressed that he has made a definite effort to move from his predominant orientation toward the unconscious, irrational and "archaic" to a consideration of so-called reality factors in his psychology of the ego and of the defense mechanisms. Some of the differentiations just mentioned are introduced there. However, Freud has subordinated the development of the ego with its reality-oriented behavior under the supremacy of the id factors, that is, under the internal, biologically determined instinctual impulses:

It is easy to see that the ego is that part of the id which has been modified by the direct influence of the external world through the perception-consciousness.

Freud tends to view character structure from a defensive point of view, and social influences as a series of traumata which bring to a halt or discontinue instinctual gratification and expression. While providing an understanding of an important aspect of the individual's attitude to society, this view does not do justice to all the satisfactions gained from moving along constructive social avenues.

Within psychoanalysis, it was Heinz Hartmann (43) who first stressed explicitly the partial independence of such outwardly adjustive processes as perception, learning and thinking from the

instinctual processes. In general, psychoanalysis has undergone, during the last few decades, some modification in the direction of including just those problems which it previously neglected. However, psychoanalytic expansion in this direction has been more programmatic than real, and there are a number of problems which can be solved only by an explicit integration of psychoanalysis with psychology and with sociology. The conceptual tools of psychoanalysis just are not sufficient fully to explain rational and social behavior (28). If we were to deny this we were to obscure the essential theoretical contribution of Freud. Some of the resistances against admitting psychoanalysis to the circle of respectable sciences may well be based on an unrecognized transfer from the realization of the failure of psychoanalysis to deal adequately with reasoning behavior.

While the neglect of certain environmental factors in Freud's theory can hardly be questioned, there are, at the other extreme, such overt behavioral psychologists as Skinner (66) who tend to look askance at the assumption of special internal dynamisms and attempt to offer an explanation of the facts observed by Freud in terms of direct relationships between resultant behavior and the stimulus environment. However, a translation of the psychoanalytic concepts into the terminology of such a stimulus-response approach, useful as it may be in certain contexts, has its difficulties and limitations. The specific contribution psychoanalysis may be able to make to stimulus-response psychology by stressing the function of internal agencies is best illustrated by means of the superego concept. Although the superego designates that aspect of our behavior dispositions which is most markedly determined by the transmission — via stimulus-response learning — of cultural norms and ethical standards, psychoanalytic theory at the same time stresses the irrational distortions which the external authorities undergo in the process of their absorption into the superego. Thus arises the seemingly paradoxical picture of a superego which originates outside — being an introjection of parental authorities and of the norms they represent — and which then becomes endowed with all kinds of unsocialized subjective tendencies (such as aggression) so that the end effect is frequently an irrational and unconscious distortion of the very values it is supposed to represent. Thus our moral feelings can probably not be fully explained by external

cultural factors; they must be seen as reinforced by the internal, hostile feelings with which, in our childhood, we projectively imbued parental figures.

The very fact that moral behavior and especially moral feelings cannot be derived exclusively from the cultural institutions as learned by the example of adults makes it understandable that patterns of behavior acquired in childhood are often intensified in old age by means of some processes of internalization in spite of the fact that they are not reinforced in later life and should therefore, according to the accepted principles of learning theory, slowly succumb to extinction. In 1942 the late Professor Hull, the foremost formalizer of classical learning theory, expressed to me his puzzlement about these facts and the difficulty he had in explaining the superego by his learning theory. Recent learning theories have paid some attention to these problems without, however, giving a fully satisfactory resolution (65). Skinner's above-mentioned reservations against psychoanalysis, on the other hand, seem to stem not so much from an involvement with classical learning theory as from a more general anti-theoretical position which is directed against both psychoanalysis and learning theory.

It is interesting to note that quite generally Freud's major contribution to the understanding of social phenomena does not lie in the writings in which he deals directly with sociological phenomena. Here as elsewhere it is his personality theory which, in spite of its limitations, seems to emerge as the most powerful influence in the end. Thus, while such sociologists as Durkheim (19) stress conformity to the social institution as something unequivocally positive, psychoanalysis helps us to distinguish the genuine from the compensatory conformity. At the behavioral level, the compensatory type of conformity is characterized by a compulsive, all-or-none character. It is excessive because it compensates for feelings of uncertainty and the attendant fear of becoming an outcast, and because it often serves the function of covering up the underlying resentment toward the social system as a whole, unconscious as this resentment may be. The compulsive conformist tends to adhere to the letter rather than the spirit of the social institutions. This tendency issues from a distortion and simplification of the system of norms and commands in the direction of what one may call unidimensional interpretation. Rules are adopted or enforced

which are largely non-functional caricatures of our social institutions, based as they are on a misunderstanding of the ultimate intent of these institutions. The absence of a genuine incorporation of the values of society accounts for the rigidity of the conformity; at the same time it accounts for a certain unreliability, a readiness to shift allegiances suddenly and completely to other, sometimes diametrically opposite authorities or standards. In this and in most other ways the compensatory conformist defeats the very purposes which are inherent in any genuine adherence to a principle. The potential of psychoanalysis eventually to become involved in the systematic treatment of behavioral results after all, is shown to best advantage in the uncovering of fake mechanisms such as that just discussed.

As we have seen, the major emphasis of psychoanalysis is on internal causes; these include, in the language of psychoanalysis, "subjective phantasies" and generally the differential meanings external events acquire for the individual. Freud began to make progress in his understanding of hysteria only after he had given up the idea of a simple environmental causation of the disease by the traumata to which the patients themselves referred. Freud points out that only after the factor of the hysterical phantasies had been introduced did the structure of the neurosis and its relation to the patient "become conspicuous." Since the relationship of these phantasies to external factors is most complex and ambiguous, it seems in the long run far more parsimonious to assume the internal mechanisms postulated by psychoanalysis and to try to specify them operationally as fully as it is possible at a later time. Contrary to Skinner we believe that such assumptions do not carry us outside of the "bounds of natural science." On the other hand, we do agree with Skinner on the point that the "looking inside the organism for an explanation of behavior" can easily lead to a neglect of environmental factors, and we readily acknowledge that it has done so in the case of psychoanalysis.

5. THE EXPLANATORY VALUE OF PSYCHOANALYSIS. MOTIVATION AND BEHAVIOR

In spite of the onesidedness of the depth-psychological approach, the unique contribution of psychoanalysis lies in the unified explanation of personality. Diverse classes of behavioral manifesta-

tions are subsumed under more general principles. Behavior is no longer defined in terms of its symptomatic characteristics but is viewed from a causal-genetic point of view.

The tangled relationships between overt behavior and the patterns of underlying "dynamics" have posed numerous methodological difficulties to objectification. There have been two major types of inadequacy in approaching these difficulties. First, some investigators worked on the basis of a tacit assumption of a perfect one-to-one correspondence between motivation and action. The concept of motivation thus is rendered a merely descriptive one; in fact, it becomes nothing but an unnecessary duplication of behavior rather than a truly explanatory, inferential construct imbued with some degree of independence. The scientist or diagnostician must avoid such direct projection of behavioral trends back into the subject without due consideration of the ambiguities inherent in the relationships between drives and behavior. To indulge in such projection in an almost postulatory fashion as is sometimes practiced would expose us to the accusation of circularity. A second and somewhat obsolete type of spurious attempt at explanation is given by the introduction of dynamic concepts which are so remote from behavior that they cannot be confirmed either directly or indirectly.

To help resolve the methodological problem involved in the definition and measurement of motivation separately from, and in a certain sense independently of, isolated bits of specific behavior, and at the same time to illustrate the way in which motivational tendencies can be operationally based on certain intercombinations of observed behaviors, the present writer (29) has undertaken a statistical demonstration of the explanatory and predictive character of psychoanalytic concepts based on the systematic study of a larger number of adolescents extending over a period of several years. For a limited set of problems, this was to be an empirical verification of psychoanalysis and was to take the place of the case-centered and thus necessarily somewhat fragmentary and often casual inferences of motivation customary in psychoanalysis. A direct intuitive assessment of underlying motivation was made, and these drive ratings were compared with the specific and directly observable behavioral techniques used by the individuals. Consider-

ing the fact that verbalized self-reports and short-sample behavioral techniques often reveal the phenotypical façade of a person rather than the genuinely dynamic tendencies of his behavior, several clinicians, closely familiar with the group of adolescents in question over a number of years, were asked to rate them with respect to the strength of their basic motivation as abstracted from a synopsis of a wide variety of long-range behavior contacts. By introducing motivational ratings we hoped to be able to account for apparently diverse manifestations, and hoped that, just as in psychoanalytic theory, an important lead for uncovering relationships might lie in comparatively few but fundamental characteristics of the subjects brought out in motivational ratings. Different classes of behavioral expressions seemingly not related among each other were found to be related to the same intuitively inferred drive, apparently as alternate manifestations of that drive. To give an example: overt behavioral ratings on "exuberance" and "irritability" were found to intercorrelate negatively with one another ($r = -.52$) and thus to be relatively incompatible; however, both these behavioral traits showed some positive correlation (+ .30 and + .42) with the ratings on the drive for aggression. The so-called multiple correlation between rated aggression and the two diverse behavior features was found to be relatively high (+ .73), thus establishing the principle of "alternative manifestations" of a drive. Our results can be more generally stated by saying that a knowledge of the type of drive variables stressed in psychoanalysis seems to hold good promise for behavior prediction of the "either-or" type just described statistically, which is in essence the either-criminal-or-lawyer type of prediction of which we have spoken in our above example from the discussion of psychoanalysis.

The results also indicate that we could not arrive at the underlying motivational variables by such conventionally used statistical means as factor analysis, at least not in its various forms customary to date. These and related techniques provide us with clusters of behavioral manifestations which intercorrelate highly with each other. The fact that certain manifestations may fully substitute for others renders the relationship in psychoanalysis that we are looking for much too complex to be handled in this simple manner. The type of evaluation of underlying motivations considered here allows for alternative manifestations of the same motivation or

instinct which are negatively correlated or which may even be mutually exclusive even though probably genetically related.

The linking of the motivational ratings to behavioral manifestations constitutes at the same time a "rational reconstruction" of the so-called "intuitive" inferences made by the clinicians. This is done by the statistical establishment of the cues which they as a group used for their ratings. The relatively satisfactory inter-rater agreements which were obtained for the motivational ratings are a further indication of the fact that we are capable not only to perceive the surface manifestations in their own right, but also the underlying personality structure. We "see" not only whether or not a person shows a friendly front but also whether his friendliness is genuine or "phony."

In the present context we are primarily interested in establishing those aspects of behavior that can be predicted on the basis of motivation ratings or a psychoanalytic appraisal of the underlying instinctual structure and those that cannot be predicted on such a basis. Since results suggest that the same underlying motivation may lead to a wide range of behavior, the further specification must hinge on other than "dynamic" factors. Among these further factors determining whether, say, underlying aggression is worked out in a socially constructive form or in neurotic symptoms, such extraneous factors as social and economic or occupational conditions will probably play a major role.

In summary, the study of motivation and behavior just reported constitutes an attempt to move from the level of the description of overt behavior and expressional techniques to the level of inferential hypotheses along basically psychoanalytic lines by discounting incidental effects of transient situations and by regrouping the forms of behavior in terms of common dynamics. In this manner we do arrive at comparatively few underlying tendencies which account for a wide array of behavioral manifestations seemingly unconnected with each other. It may be added that further evidence shows that we also arrive at predictions about phantasies of our subjects which are markedly superior to predictions based on the direct use of overt behavior. In our empirical work our assumption of the increased economy and greater explanatory value of constructs relating to underlying dynamics has been justified by means of a multiple-correlational analysis.

The one major way in which academic psychology has attempted explanations of behavior is by means of physiological models. So far not too many predictions from such models have been deduced, however; and those that have been refer to rather simple types of behavior, e.g., the laws of so-called *Gestalt* perception or some of the basic mechanisms of learning. It is hardly an exaggeration to say that we may disregard these types of explanation as far as the field of personality is concerned. The non-physiologically oriented learning theories have introduced, in somewhat piecemeal fashion, a number of constructs originally restricted to relatively simple types of behavior. There have been many attempts to expand learning theory to the problem area covered by psychoanalysis. As we have exemplified above by means of the example of the progressive non-reinforced internalization of the superego, it seems doubtful that the commonly employed principles of learning are capable to explain all of the major discoveries of psychoanalysis, the efforts of Gustav Bergmann (3), of Dollard and Miller (18), and of others notwithstanding. I shall come back to this point later.

The view that psychoanalysis is explanatory in contrast to most of academic psychology which moves at the level of description may be supported by reference to Feigl's theoretical discussion of levels of explanation. Feigl (22) distinguishes four levels of scientific discourse. The first is the level of description, dealing with specific statements, logically in singular form, by means of which is stated what is directly observed. The second level is that of empirical laws, that is, of generalized functional relationships between relatively directly observable magnitudes. The third level, called first-order theories, involves a set of assumptions from which empirical laws can be derived. It is only by means of theory that a unification and an understanding of the functional relationships between facts as expressed in empirical laws can be achieved. While in first-order theory the constructs used are homogeneous with the operationally defined concepts used in the empirical laws, the constructs of the theories of the second order — the fourth level in Feigl's hierarchy — are heterogeneous to the empirical regularities which the theory purports to explain; an example is the physiological explanation of regularities of overt behavior. Feigl places psychoanalysis at the third level in this scheme, that is, at the level of

first-order theories, together with the theories of Tolman and Hull. Although we follow Feigl to this point, the question remains whether or not a certain group of psychoanalytic concepts such as that of the unconscious should be considered to be as heterogeneous to behavior as are physiological constructs or explanations. It should be noted in this context that Feigl's somewhat restrained preference for physiological explanations of behavior is evident in all his writings. It is the assumption of the unconscious which establishes the major difference between psychoanalytic theory construction, on the one hand, and Tolman and Hull, on the other.

Before continuing the discussion of the properties of psychoanalytic concepts we should like to deal shortly with some more vaguely philosophical arguments which question the explanatory value of psychoanalysis. Toulmin (69) argues that the psychoanalytic explanations constitute an account of "motives rather than of causes," since they provide the patient with plausible reasons for his neurosis and do not necessarily relate to objective facts. Expanding this argument, Flew (25) states that Freud as a working psychoanalyst makes patients realize what their unconscious motives, purposes and intentions are, and then proceeds as a theoretician to assume that the inferred unconscious processes are capable of producing real symptoms while only "real" physiological and neurological processes could do such a thing and mere inferred unconscious processes have nothing to do with causes. Arguments of this kind stem from confusions about the nature of concepts; here we may follow Dingle (17), who in his answer to Toulmin and Flew takes the point that the concept of the unconscious is in no way different from that of the atom or of light.

Far from identifying the reported motive and the objective explanation of behavior, the major merit of psychoanalysis is to have differentiated the two and to have unmasked and "discredited" as to their explanatory value the subjective experiences of motivation. The phenotypical, "manifest" characteristics are now taken to provide only the indirect cues for inferences concerning the "latent" genotypical (conditional-genetic) forces of motivation.

In all the efforts to distinguish manifest behavior and latent motivation, surface and depth, our path is full of obstacles, some of which go beyond the merely methodological ones encountered in the procedures of scientific verification. One of these additional

difficulties is a semantic one. The vocabulary of everyday language does not furnish us consistently with two separate sets of terms, one for overt behavior and the other for underlying motivation. Unless we are ready drastically to depart from familiar usage of terms, we must use "friendliness" for both the basically friendly outlook on life and for the techniques of friendliness — genuine or fake — by which this basic outlook may be implemented or pretended. The same holds for such terms as "aggression," "submissiveness," etc. Qualifying adjectives are needed to specify the meaning of the word "friendly" or "aggressive" in each case it is used. In the first place, such double usages make for unmanageable clumsiness; second, and more important, is the fact that they present a challenge to our claim that the splitting up of the vocabulary is really necessary.

This dilemma is in a formal sense similar to the one presented by the two-faced meaning of our common perceptual terms which was pointed out by Egon Brunswik (12). These terms too tend to have double reference, one to the personal and somewhat variable perceptual response, and the other to the interpersonal measured physical stimulus that underlies the so-called "corresponding" response with some but by no means perfect regularity. Examples are phenomenal versus measured size, shape, color, pitch, and so forth. Phenomenal size or shape can be experimentally shown to depend in a multiple fashion on a variety of measured sizes or shapes in our surroundings or at the retina. The same holds for color, and subjective pitch has since the time of Helmholtz been known to depend on both the frequency and the intensity of sound, so that 'pitch' is no longer admissible as a synonym or translation for 'frequency.' If in view of these tangled relationships the conceptual separation of perceptual stimulus and response can be said no longer to constitute a case of entities superfluously multiplied; neither can, we may add, the separation of behavior and motivation with their similarly tangled relationships. Each time separations of this kind had to be substituted for previous identifications in the history of science, there was irrational, emotional resistance against the recognition of the equivocations or ambiguities involved. These resistances remind the present writer of the syndrome of "intolerance of ambiguity" she has found to be a major characteristic of the authoritarian personality (30).

Certainly, both our "motivations" and "behaviors" are constituted from overt behavior, as both stimuli and perceptual responses constitute different types of observational experiences. But motivations are arrived at through a synopsis of the constant elements in many bits of behavior, while the latter are momentary manifestations. The important point is that the two sets are to some extent operationally independent, and that they turn out to be actually independent to a surprising degree by the frequency of alternative manifestations of identical motivations, and vice versa. An independent nomenclature for the levels will in the end have to be established. This would remove much of the temptation to fall back into an oversimplified single-level treatment of the motivational aspects of behavior as is still present in such recently suggested concepts as that of "manifest need." For example, it can be shown (28) that Murray's frequently quoted list of "needs" (54) is by no means free of duplications of overt behavior patterns, his own warnings to the contrary notwithstanding.

In the process of the conceptual differentiation between motivation and behavior a further semantic aspect will have to play an integral part. We mean the use of minimal cues such as those to be described later in this paper as an indication of the frankness or "genuineness" of behavioral expressions.

The problem of genuineness of behavior which has proved so crucial for the considerations in this section is comparable to that of strict "correspondence" versus "non-correspondence" between a certain stimulus variable and a certain response variable in perception to which we have referred above, and thus to the problem of the accuracy or correctness of perceptual performance.

6. ARE PSYCHOANALYTIC CONCEPTS HYPOTHETICAL CONSTRUCTS OR INTERVENING VARIABLES?

In a paper which has attracted much attention in the literature on psychological theory, MacCorquodale and Meehl (50) proposed to distinguish between "intervening variables" as quantities obtained by specified manipulations of the values of empirically observed variables, and "hypothetical constructs" which involve assumptions about an additional entity, process or event not directly observed. Statements dealing with intervening variables contain no terms which are not definable either directly or by reduction

sentences in terms of empirical variables. According to MacCorquodale and Meehl, they represent nothing more than shorthand summaries about observables and contain no inferences as to the occurrence of unobserved events. Carnap's dispositional concepts are given as an illustration of intervening variables, while "electron" is given as an example of a hypothetical construct. While it is admitted that the statements about electrons also are supported by observations, these are said not to exhaust the entire meaning of the sentences about electrons.

In the field of psychology, hypothetical constructs are illustrated by MacCorquodale and Meehl by physioneurological models of behavior. A parallel is drawn between intervening variables and "abstracta" in the sense of Reichenbach (57), and hypothetical constructs as corresponding to Reichenbach's "illata." To the latter inferred entities belong such constructs as other persons' "minds." These are inferred on the basis of our sensory impressions, but statements involving them are not reducible to sentences about impressions; they have what Reichenbach calls a "surplus meaning." MacCorquodale and Meehl assume surplus meaning only in case an effort at explanation from another domain is made. Thus physiological explanations of behavior are assumed to have surplus meaning in the behavioral frame of reference only but not in the framework of physiology proper.

In the rather sketchy application of their distinction to psychoanalysis, MacCorquodale and Meehl point out that psychoanalysts originally introduced such terms as libido, censorship, or superego as intervening variables, claiming them to be conventionalized designations of observable properties; but they add that in the course of further discussion there usually is an unnoticed shift in the direction of using them as hypothetical constructs. The authors point to certain elaborations of the concept of libido which Freud first introduced as an abbreviation for a set of sexual needs but then proceeded to describe as "flowing," as being "dammed up," as "tending to regress to early channels," as "being converted" into anxiety, and as "making its energy available" to the ego. The authors do not object to the concept of libido on the grounds that it refers to unobservables, but merely because the postulates concerning existential properties are not explicitly announced. A further argument which MacCorquodale and Meehl

raise against the "hydraulic" analogy of the libido as used by Freud is that analogies of this kind would have to consider the knowledge now available in physiology. They continue to argue that no known properties of nervous tissues could correspond to these hydraulic properties and that the nervous system does not contain tubes and pipes.

Although we find the distinction between intervening variables and hypothetical constructs useful because of its emphasis on differences in the degree of indirectness of evidence, we at the same time consider it in many ways misleading. First, the authors seem to conceive of hypothetical constructs mainly as assumptions about physiological processes. They do not discuss what seems another frequent type of hypothetical construct, that is, one in which the actual properties are neither presently determined nor expected to be determined in the foreseeable future.

Second, by reiterating that intervening variables are definable in terms of observables, the authors fail to stress that statements containing intervening variables can, at least in principle, no more be exhausted by statements about observables than can those about hypothetical constructs. We recall here the changes in the views on verification which occurred within the school of logical positivism. To quote Carnap (15):

If by verification is meant a definite and final establishment of truth, then no synthetical sentence is ever verifiable. We can only confirm a sentence more and more. Therefore we shall speak of the problem of confirmation rather than of verification.

According to Carnap, even such simple sentences as "There is a piece of white paper on the table" need an infinite number of operations and statements to be verified. Empirical laws are not verifiable since they refer to an infinite number of instances while all observation is finite.

According to this view, the difference between universal and particular statements must be minimized. It also follows that the interpretations of the testability criterion in terms of complete verifiability or of complete falsifiability are inadequate and too restrictive. This holds especially for the physical disposition terms referred to above, such as 'magnetic' or 'electrically charged';

these are introduced by means of so-called reduction sentences which, in spite of their function as operational links, have the character of partial or conditional definitions. They are not definitions in the strict sense of the word, however; they are fragmentary specifications of meaning. Following Carnap, Hempel (44) states explicitly that sentences containing disposition terms cannot be fully translated into statements about observables; they involve "open" terms and require an indefinite series of conditions to be tested.

It seems to follow from these considerations that intervening variables in the sense of MacCorquodale and Meehl, referring as they do to a generalized variety of conditions, are likewise elements of "explanation" even though they are of a less tentative and less "theoretical" variety than hypothetical constructs. Since the examples given by the authors for hypothetical constructs are almost exclusively concerned with physiological explanations of behavior, it is not quite clear whether or not their distinction coincides with that of Hempel (44) between theoretical constructs introduced by postulates, on the one hand, and concepts introduced by definitions or reduction chains based on observation, on the other. In practically all of the concrete instances of theory construction in science it is not an easy task to decide whether a given concept has been arrived at primarily on the basis of theoretical considerations or primarily by observation. This holds especially for such a relatively immature theory as psychoanalysis. We would venture to guess that Freud, guided by some relatively fragmentary initial impressions, has arrived at many of his constructs in a process of building a theoretical structure, with empirical interpretation lagging somewhat behind. A careful reading of Freud makes it quite clear that more space is devoted to the definition of theoretical constructs, such as superego, ego and id, in terms of their structural relations to each other than by reference to the relations of these various constructs to observation.

The distinction between intervening variables and hypothetical constructs may to a certain extent be preserved in the face of the above arguments by differentiating between two kinds of surplus meaning. The first kind could briefly be labelled "observational surplus"; it is given by the inexhaustibility of possible tests to be applied in the confirmation of an empirical statement and therefore

is present in all intervening variables. The second we will call "existential surplus"; by this we mean primarily the hypothetical transcendence beyond the existential frame of reference in question, such as when a micro-structure is adduced in the explanation of macro-behavior.

The involved character of the above considerations makes it difficult to decide whether in psychoanalytic theory we deal mainly with hypothetical constructs or with intervening variables. For example, the concept of unconsciousness may be classified as a hypothetical construct if it is meant to refer to a theoretical system, not yet determined in physiological terms but with the claim that one day it will be determined. In this case it involves the assumption of an entity which goes beyond the behavioral framework *per se* and from which many particular occurrences are being derived. On the other hand, if we conceive of the unconscious wish to kill one's father, or the unconscious wish for failure, then we have before us what may be considered intervening variables, since reduction to if-then type of statements seems possible for all cases involving the use of these terms. Many of the psychoanalytic terms are disposition terms; they refer to latent qualities which become manifest only under specified conditions. As disposition terms they are intervening variables in the sense of MacCorquodale and Meehl. As we have seen, however, their definition remains incomplete and open since we cannot specify all conditions and manners in which latent tendencies become manifest. For this reason it may be preferable not to consider a disposition predicate as defined by the total number of reduction sentences formulated at any given stage of a science. The actually stated conditions of testing constitute as a rule but a limited selection at which we may have arrived by an informal process of ingenuity, leaving the possibility open for the discovery of new conditions to be added or to be substituted for the old ones.

Since intervening variables share with hypothetical constructs the fact that excess value is being added to the observed phenomena, their distinction should be viewed as one of degree rather than of principle. However, while Bergmann, in a recent survey of theoretical psychology (4) which appeared after the relevant parts of the present paper had been written, goes so far as to obliterate the distinction altogether, the present writer would favor to retain it

as a gradual one. Hypothetical constructs are higher-order concepts from which intervening variables can be derived. In Feigl's scheme of explanations, mentioned above, the disposition terms have to do with empirical regularities while hypothetical constructs may furnish the constructions by which the disposition terms are unified. But again we must stress that disposition terms as such already contain unifying principles, although there remains a difference in the degree of accessibility to confirmation which may be ascribed to the heterogeneity of the hypothetical constructs relative to the observations to which they are adduced.

The fact that intervening variables are not fully defined and fully interpreted in terms of observation raises the question as to whether inferential concepts should be employed at all. Against such a restriction we hold that overly specific or narrow concepts are usually not too helpful. Psychoanalytic theory is far from succumbing to this danger. It abounds in both intervening variables and hypothetical constructs the specification of which often falls short of even the more liberal requirements adopted in this paper. However, Freud's use of a mentalistic and phenomenalistic language creates the erroneous impression that he stayed closer to the verbal behavior of his patients than he actually did. These and other phenomena and symptoms were used by him as a basis for the construction of genuinely inferential concepts, although the connecting links between the two levels were not always made explicit. The indicated narrowing of the gap between intervening variables and hypothetical constructs may support our tendency to reduce the stringency of the requirements for the establishment of hypothetical constructs.

Here we must add a few critical remarks concerning MacCorquodale and Meehl's requirement that hypothetical concepts which refer to physiological entities must correspond to our present-day knowledge in physiology. The progress of empirical science would be unduly hampered if all our explanatory terms had to be specified fully in terms of the discipline from which they are taken. Progress in physics has been greatly furthered by the use of often wild-sounding assumptions or models. We have seen that Freud was fully aware of the fact that in view of the state of the biological sciences he could not utilize knowledge from physiology and anatomy; yet he did not hesitate to improve his own models, and

was amply rewarded. The hydraulic model of Freud mentioned above led to a fruitful conception of psychological relationships, and such visualizations as that of the dammed-up libido having to use devious channels when blocked led to a deeper penetration of the relationships involved and to improved predictions. Similarly, to think of repression in terms of "keeping something down" so that stronger forces are necessary to counteract the repressed force, leading often to an intensification of the counteractive forces, seems to be a more productive way of thinking about the processes involved than would be a purely descriptive statement about a sequence of certain events. As far as the possibility of an eventual reduction of these analogies to physiological observation is concerned, Freud was, as we have seen, most hopeful. The question of the reduction of psychoanalysis to physiology is, however, an empirical and not a logical one.

In the literature there seem to be differences of opinion as to whether science tends to proceed from hypothetical constructs to intervening variables or in the opposite direction. The question is raised as to which of the two represents the more mature stage of scientific development. It seems that scientists, especially those with great ingenuity, have frequently proceeded from observations directly to hypothetical constructs and have derived the intervening variables later, although sometimes the procedure was reversed. The most fruitful policy seems to be that of an alternation between the cultivation of the images and constructs with all their richness of meaning and a concerted effort toward a more precise observational specification of the terms involved. There can be no doubt that the ultimate function of science is the achievement of these greater specifications and clarifications. For the sake of the continued creativity of the scientific process, however, it is important to keep in mind that the specifications do not always reflect the full content of the original meaning. Thus Freud at first made relatively specific observations about repression of sex instincts; these observations stimulated him to introduce the concept of the unconscious; only after that did he proceed to specify a number of other mechanisms which account for the transformation of unconscious material and which constitute the heart of the Freudian theory. The oscillation between hypothetical constructs and intervening variables seems to afford a protection against both a too

narrow operationalism and the dangers of meaningless generalization.

7. ATTEMPTS AT CONFIRMATION OF PSYCHOANALYTIC HYPOTHESES

As we have seen, the elements of overt behavior and of inferred motivation vary to a certain degree independently. But since the underlying motivation is often unconscious and can, therefore, not be verbalized by the subject, and since it also is disguised by the behavioral techniques used by the subject, there are difficulties inherent in the observation and measurement of the underlying motives. By referring to concepts more removed from the immediate data, psychoanalysis has lengthened the chains of intellectual and experimental work which connect the principles with the protocols or observation. We may recall the statement of Philipp Frank (26) that in modern physics greater ingenuity is needed to find ways of verifying the theories in question, and that this fact is a result of the greater abstractness of concepts. He has pointed out how easily the statements of traditional Newtonian physics could be verified by observation since they were a direct formulation of our everyday experience, obvious and plausible to common sense. He goes on to explain that

in Einstein's general theory of relativity, however, the description of the operations by which the quantities involved could be measured becomes a serious and complex task. It becomes an essential part of the theory (p. 19 f.).

Psychoanalysis thus shares with physics in the fact that their statements do not lend themselves to direct and obvious confirmation. In either case, the highly interpretive statements involved do not carry the rules of their confirmation as obviously with themselves as do descriptive statements. The situation in psychoanalysis was further complicated by a certain tendency — leading obviously into a blind alley — to attempt an isolation of some of its statements which could only be understood in the context of other statements, and by some futile attempts to find an "experimentum crucis." But there also is increasing realization of the fact that more stress should be placed on the verification of predictions than of the theories themselves.

Several possible ways to circumvent the methodological difficulties involved in the approach to the latent level will now be discussed briefly.

Let us begin with verification attempts based on the therapeutic process. The ego defenses which are at work to prevent the patient from consciously facing many of his basic tendencies or conflicts are being gradually removed in this process so that a more correct picture of the underlying dynamic realities emerges. Many promising attempts are being made to render the therapeutic diagnosis and procedure accessible to intersubjective scrutiny. Recording of the procedure allows submission of the material to more than one observer, a checking of predictions, and a comparison of interpretations and evaluations, the latter being stressed especially by Kubie (49).

One of the most important aspects in the objectification of psychoanalytic knowledge in general will be the making explicit of the cues which the therapist uses in his interpretations. At the same time this will help to reduce the subjectivity of the individual interpretative process. Freud's benign yet sophisticated outlook on the dangers of interpretation may be illustrated by the following quotation:

Our justification for making such inferences and interpolations and the degree of certainty attaching to them of course remain open to criticism in each individual instance; and it is not to be denied that it is often exceedingly difficult to arrive at a decision — a fact which finds expression in the lack of agreement among analysts. . . . For in psychology, unlike physics, we are not always concerned with things which can only arouse a cold scientific interest. Thus we shall not be so very greatly surprised if a woman analyst who has not been sufficiently convinced of the intensity of her own desire for a penis also fails to assign an adequate importance to that factor in her patients. But such sources of error, arising from the personal equation, have, when all is said and done, no great significance. If one looks through old textbooks upon the use of the microscope, one is astonished to find the extraordinary demands which were placed upon the per-

sonality of those who made observations with that instrument while its technique was young, and of which there is no question today.

Next is the experimental approach to underlying motives. This approach has thus far been satisfactory only in certain specific directions. Since the ego-defenses are nearer to the surface, they have proved particularly attractive for experimental investigation. Thus we find a number of experiments aimed at verifying psychoanalytic statements on fixation, regression, repression, and projection. Sears (63) and more recently Hilgard (45) have summarized and discussed many of these experiments. It is interesting to note that Sears comes to the conclusion, and we follow him here, that hypotheses on fixation and regression have been better confirmed experimentally than those on repression and projection — and, we would add, better than those on reaction formation. This agrees well with one of our contentions made above. Fixation is indeed a descriptive concept referring either to persistent attachment to a certain love-object or arrest on a certain developmental level. We may refer here to an experiment with newborn rats (73). For a period of a few weeks some were blindfolded and the others had their ears stopped. When, after full growth was attained, the rats were put under stress, the first group developed functional seeing difficulties, and the second group functional hearing difficulties. In this experiment, undertaken by A. Wolf, it was possible to isolate early trauma and to show the ensuing fixation and regression. Blindfolding and ear-stopping at a later date did not lead to the same consequences, which is in line with psychoanalytic emphasis on the earliest phases of infancy. The effect of certain infantile frustrations was demonstrated by Hunt (46). Rats starved in early infancy were found to eat and to hoard more food in later life than those who had been fed satisfactorily while young. By producing different types of conflict in animals, Masserman (52) studied some aspects of the origin of neurosis in animals, and even the effects of what amounted to various types of therapy. Only a relatively small segment of psychoanalytic theory can be effectively tested with animals, however.

The relation of frustration to regression has also been demonstrated in children. Barker, Dembo and Lewin (2) first induced a

group of children to play with parts of toys, the gaps to be filled out in imagination. Then the children were shown a fuller and more attractive set of toys through a glass window. Their approach to the available toys as well as their general behavior deteriorated markedly after this frustration.

The relative difficulty of studying experimentally such further mechanisms as repression or reaction formation has above been ascribed to the fact that the concepts involved derive from the more inferential and abstract parts of psychoanalytic theory. Repression was originally described by Freud in connection with the handling of threatening id-impulses, primarily those of sex and aggression. Complex conditions, such as those involved in the analysis of transference, are required before that which was repressed may become conscious. Most of the frequently adduced experiments dealing with such facts as memory for overtly pleasant or unpleasant words cannot be brought to bear on psychoanalytic assumptions of this kind, for these are concerned with quite a different matter. Since repression proper extends to the ideational content originally connected with the forbidden instinct, the selection of words which are consciously pleasant or unpleasant for the average person may have very little dynamic relevance for a particular subject. Furthermore, contrary to widespread belief, Freud did not assume that only the pleasant is remembered. In *Beyond the Pleasure Principle* (37) he discussed the tendency of children to reproduce anxiety-inducing experiences in play as well as in dreams in order to achieve mastery of the traumatic situation. Misunderstandings of psychoanalytic theory have arisen when in the manner described statements concerning repression which originally were intended to refer to unconscious — that is, inferred rather than overt — processes, are erroneously taken as purely descriptive statements of conscious contents. As in physics, a simple identification of statements containing disposition terms with statements about manifest events is not permissible.

Some of the leading learning theorists, such as Dollard and Miller (18) and Mowrer (53), have contributed challenging and life-near experiments conceived in the genuine spirit of psychoanalysis. Certain mechanisms, such as regression, fixation, and displacement, were effectively demonstrated by these experiments. Sharing a "historical" outlook with psychoanalysis, the learning

approach has highlighted microscopically such mechanisms as reinforcement or generalization which are also implicit in psychoanalysis. However, learning theory cannot completely explain why in certain contexts we learn as little as we do, as psychoanalysis has impressively demonstrated. Norman R. F. Maier's (51) assumption of two different mechanisms of behavior, the motivation and the frustration behavior, constitutes a recognition of the same kind of fact; in the system of Maier only motivation behavior is the learning type of behavior, frustration-instigated behavior is not.

The general reason why the typical psychological laboratory experiment is not well suited to the purpose of verifying or disproving psychoanalytic hypotheses is its preoccupation with the isolation of relatively irrelevant variables and with psychological tasks which have little to do with the vital processes psychoanalysis is concerned with and in which even success or failure is usually of little relevance. Much of this preoccupation is avoided in the so-called "projective" techniques with all their subvarieties in which the meaning or story "theme" imputed by the subject to ambiguous pictures is made the basis of interpretation, as well as in certain of the more complex memory experiments and in some further related types of procedure. All these techniques give access to dynamically relevant material and the transformation it undergoes when it passes into consciousness chiefly because they do not insist on the unattainable requirement that the subject drop his defenses to help our effort to study his unconscious. The defenses, as well as the tendencies against which these defenses are erected, are revealed in a more indirect manner. Along the same lines Kubie (49) has advocated the study of materials brought forth in free association, in hypnosis, and under the effect of certain drugs.

Still other experimental studies have verified such seemingly far-fetched psychoanalytic assumptions as symbolism. We are thinking here primarily of experiments by Schrötter (62) and by Bethlein and Hartmann (7) at the Vienna Psychiatric Clinic in which stories with crude sexual content were told to uneducated hypnotized subjects and to Korsakoff patients. These stories were dreamt about or reproduced in memory with the spontaneous use of symbols for sexual content in conformance with standard psycho-

analytic assumptions. A similar study was conducted by Brenman (10), who asked her subjects to recall fairy tales which they had heard during childhood. The reproductions showed omissions and distortions in the direction of the emotional needs of the subjects as ascertained by the Thematic Apperception Test (54) and by hypnosis.

Turning now to the genetic approach, the study of psychosexual development in its various stages assumed by psychoanalysis (oral, anal, phallic, etc.) has been attempted by Blum (9) with the use of twelve cartoons depicting a dog, named "Blacky," as engaging alone or with his parents or siblings in all the activities assumed to be relevant for the various libidinal stages. The interpretation of the cartoons has been found to correlate with the psychodynamic pattern of the subject. Again, the subject is less on guard and less apt to protect himself, describing as he does the activities of a dog rather than those of a human. Still, the interpretation of the Blacky-test remains much more uncertain than the author assumes.

It has been pointed out by many observers that although psychoanalysis is mainly genetically oriented and explains much of adult behavior in terms of early childhood experiences, most of this knowledge is based on a reconstruction from the therapy of adults rather than on direct observation of the child. Such a classic psychoanalytic summary of the development of mental and instinctual processes as that by Fenichel uses almost exclusively examples from neurotics and psychotics to discuss what happens in childhood. Observation of children would seem the more fruitful, as the instinctual processes have not yet undergone the transformations which are supposed to occur under the pressure of family and social institutions. The ultimate requirement for a dynamic child psychology remains the ascertainment of the interrelationships of early childhood events to later personality structure, and only a so-called "longitudinal" study planned under the auspices of genuinely psychoanalytic modes of thought and extending over several decades could give an adequate answer. How to get hold of all the events which acquire meaning for the growing child and how to interpret these events, especially in the pre-verbal stage, still offer staggering methodological difficulties.

8. FORMAL CRITERIA IN A STUDY OF SELF-DECEPTION

In an experimental study of mechanisms of self-deception this writer (27) has attempted to make the ego-defenses themselves the focus of exploration. Self-descriptions — as well as asserted "guiding principles" for conduct — were compared with descriptions of the subjects' actual behavior by detached observers well acquainted with them. The distortions in an individual's self-appraisal were found to be greatest in the areas of actual behavioral shortcomings. The defense mechanisms of the type described in this study can be shown to be in a formal sense very similar to those described in psychoanalysis, although the emphasis is mainly on the defenses against loss of self-esteem rather than on defenses established in early childhood against instinctual dangers. Projection, for example, is in both cases defined as the ascribing to the environment what is internal and at the same time rejected. In the area of overlap with psychoanalysis lie especially our self-deception mechanisms of distortion into the opposite, minimization, rationalization, and projection. These mechanisms make it possible for the individual to see himself, say, as highly sincere even though he is judged by others to be highly insincere.

The findings of this study help to throw light on the problem of the function of consciousness in behavior. The inverse signalizing given by the mechanism of distortion into the opposite is frequently also expressed in the so-called guiding principles of conduct, for a report of which we had also asked. The ultimate function of this inverse signalizing in consciousness, especially in its latter form, is probably the modification of behavior. We find, furthermore, projective types of distortion, exemplified by a subject judged to be very aggressive who at the same time demanded that others be more friendly. One of the subjects rated as lacking in self-discipline demanded a much stricter organization of the institute to which he belonged. Thus sometimes the function of consciousness seems to be of a defensive and compensatory character, protecting the individual from a painful truth which he has been unable to face. This is in harmony with the general view psychoanalysis takes of consciousness. In other cases we found a conscious realization of shortcomings in oneself which were perceived by others not until later because they were hidden behind a well-functioning façade.

Our next step was to establish criteria by which we could ascertain whether in a given case the underlying motivational and behavioral realities were distorted or faithfully mirrored in consciousness. This brings us to certain semantic aspects of our results and their diagnostic implications. For example, we found that self-descriptions which do not correspond to the social realities are formulated in an exaggerated way. This exaggeration was found to be symptomatic of the absence rather than the presence of the asserted desirable trait. The use of such linguistic devices as superlatives, generalizations, and repetitions was found to be statistically concomitant with a shortcoming rather than a strength in the area concerned. The greater the definiteness and lack of shading and the greater the intolerance of ambiguity in the self-description of favorable traits, the less often as a rule were the traits concerned found to be present according to the judgment of close acquaintances. A list of "formal" cues of this kind, derived from our material (including some later studies) and useful in the interpretation of the truthfulness or sincerity of behavior or of self-reports, include the following: exaggeration; absoluteness of emphasis; intolerance of ambiguity; predominant reference to the extreme values of what actually is a continuum; inconsistency of general with specific features in behavior or in verbal description, or of responses to direct as compared with indirect questions; the occasional breaking through of a pattern of denial; deviations from the perceptions, concepts, and other answers which constitute the norm for the group as a whole; stereotypy; over-concreteness; small range of variability in response; repetition; and all manner of rigidity.

It may be assumed that these formal characteristics are less subjected to censorship than is the type of instinctual content studied in psychoanalysis proper. They may, therefore, in certain contexts be of greater diagnostic value than are symbols and other direct disguises for content elements.

In the approach just described we have taken a path around the individual's self-perceptions and around the disguises his basic tendencies undergo in his own awareness or overt behavior by having other observers evaluate the dynamic realities of the subject on the basis of his overt behavior. Another method relies entirely upon the statements a subject gives about himself but involves such

a broad matrix of his statements that we are enabled to discern, with the help of the formal semantic criteria derived from the previous type of approach, whether or not the behavioral realities are consciously or unconsciously distorted. An example of this procedure is the interpretative evaluation of interview material. Thus the authoritarian child tends to begin with assurances of great admiration and love for the parents in reply to rather general questions but proceeds to reporting episodes of victimization and injustice in answer to more specific questions (30). A somewhat similar inconsistency is given by the case of an ethnically prejudiced child who, though relating only positive feelings while talking directly about his parents, omits his parents from the list of persons he would take with him to a desert island.

In comparing the interview with the projective techniques concerning their power of penetration to the dispositional layer, we find that while in some individuals, especially in those in whom underlying tendencies are near the surface yet not quite conscious, the projective material seems to highlight certain dynamic tendencies in a particularly direct and dramatic fashion, other individuals appear definitely less differentiated on projective tests than they do in their reactions to direct interviews.

9. PSYCHODYNAMICS AND COGNITION

One of the areas best suited for the testing of some of the psychoanalytic hypotheses as well as for the expansion of our knowledge of dynamic ego-psychology is that of perception and of cognition in general.

In academic psychology, perception and cognition were first approached under the aspect of the universal laws of general psychology including psychophysics, and with an emphasis on a cognitive "task" and the subject's way of solving it. In the foreground of attention stood the adaptation to reality. Individual differences were at first neglected, and their tracing back to the varying histories and motivations of individuals has hardly come into its own even today. For a long time the dominant tradition was that of association psychology with its conception of the human mind as a *tabula rasa*. *Gestalt* psychology was the first to introduce an organ-

istic factor of cognitive organization, but this in turn was derived from the assumed general structure of the physiological apparatus rather than from more specific genetic sources, be they intellectual or emotional. Thus the cognitive processes continued to appear mainly as transmitters of characteristics of the physical stimulus, and all distortions appeared as reflections of certain characteristics of the cognitive system itself.

Beginning in the nineteen hundred twenties there appeared on the German psychological scene typologists such as Kretschmer (48) and Jaensch (47) who claimed the existence of over-all styles of personality which would be manifested in a variety of cognitive patterns. Investigators in this group likewise tended to pass by motivational factors. Related to this typological approach is the approach via the pathology of thinking as represented by Bleuler (8), Kurt Goldstein (42), and Norman Cameron (14). Under these auspices pathological, especially schizophrenic, thought patterns are described primarily in their illogical properties or as lacking the appropriate abstractness. It is pointed out how symbols are treated as realities, and how thought processes show instability of organization "with a relative inability to exclude contradictory, competing or irrelevant reactions (overinclusion)" (Cameron). In still another related approach the emphasis is on developmental aspects of cognition. Stages of thought patterns are differentiated mainly from the standpoint of coherence of organization or adequacy to reality, and seen as determined by maturation. Piaget (56), Heinz Werner (72) and others stress the egocentric, syncretic, diffuse, physiognomic, rigid and at the same time labile character of the thought processes in the child or the immature person. These latter descriptions begin to resemble the notions concerning primary processes as entertained in psychoanalysis.

Still further, and more distinctly under the influence of psychoanalysis, are the studies dealing with the influence of motivation on perception, often summarized under the label of autism. Yet it must be remembered that within academic psychology autism in motivation and cognition is on the whole not conceived as the result of early psychosexual experiences and dynamic mechanisms; the emphasis is mostly on temporary or otherwise personality-alien factors defining a single motivational force in relative isolation. Such forms of motivation as want, fear, experimentally-induced reward

or punishment, and other social values are superimposed upon a problem rooted in the tradition of the general psychology of cognition. In all the approaches listed so far in this section we find what may be called a "cognition-centered" orientation, that is, a basic dependence on the outlook, problems and techniques developed in general psychology or descriptive psychiatry.

In the context of psychodynamics proper, on the other hand, we must think of a quite opposite type of approach, one in which problems are primarily organized about our notions of the motivational core of the person and are only secondarily extended to the field of cognition. This kind of approach we may call "personality-centered" (30). Such an orientation lays stress on the irrational, unconscious and archaic layer of the personality, the discovery of which constitutes the major contribution of psychoanalysis in its basic function as depth psychology.

As mentioned above, Freud was well aware of the vicissitudes of the id under the influence of reality. Still, he viewed the functioning of the ego and character structure under the aspect of defensiveness more than under that of adaptiveness. Although it is assumed that in the course of development an objective, reality-adequate approach supersedes the primal undifferentiated, wish- and fear-ridden outlook, the primary process is not assumed to lose its dynamic significance; according to Freud "the voice of the intellect remains low" even though it is also seen as "persistent." Taking off from Freud, several psychoanalysts have formulated challenging hypotheses concerning the relationship between thought patterns and underlying dynamics, however. These have far-reaching implications on the timely problem of the psychodynamics of acceptance or rejection of scientific theories.

We may illustrate this by means of Theodor Reik's (59) cogent analysis of ecclesiastical dogma. According to him, the dogma of the trinity is a compromise formation which achieves the unification and reconciliation of what appears to be a logical contradiction. This dogma makes it possible to award Christ, the son, a position beside or really above God, the father, and at the same time to preserve the unique position of God as the father. Reik believes that in every dogma there is an attempt to unify opposing impulses; in the historical development of dogma there is an alternation between the prominence of the repressing agencies and the

return of the repressed ideas. The emphasis placed on the certainty of the dogma originates in the defensive battle against doubt and heresy. As in the obsessional idea, the mechanisms of dogma are those of generalization, displacement, isolation; the transfer of doubt to insignificant detail serves to prevent the latent meaning of the obsessional idea or of the actual dogmatic statement from becoming conscious. Contradictions in both dogma and obsessional thinking can be explained by the oscillation between two opposing poles or by ambivalence which, as Freud has pointed out, plays so large a part in obsessional neuroses. There is a stress on the differences resulting from the privacy of the obsessional ideas, which are usually kept hidden or unconscious, and the proclamation of religious doctrines, which endeavor to become official and public.

In his detailed phenomenological account of the thought patterns and total approach to life of the masochistic personality (58), including the cultural aspects of masochism, Reik stresses the significance of fantasy, the suspense factor and the demonstrative and provocative features of this syndrome. In consequence of his lively imagination the masochist is prone to anticipate punishment and the anxiety connected with it and thus tends to prolong the suspense. Masochism is seen as induced by social forces and by their intimidation of the ego in fantasy. The masochist seems to acknowledge the demands of reality but at the same time he defies them by an exaggerated obedience which turns the meaning of the demand into its opposite.

Fenichel's (24) hypotheses concerning certain patterns of perception in compulsives (some of which were empirically verified by B. Rosenberg in a recent University of California doctoral dissertation) have considerable bearing upon the present discussion. Over and above such relatively well-known features as magic thinking, the mechanism of isolation, displacement onto small detail, and the compulsion to doubt, Fenichel considers the "inhibition in the experiences of *Gestalten*" an important characteristic of compulsion neurotics. He points out in detail how isolation separates constituents of a whole and prevents the compulsive person from awareness of the whole, and how the thinking in compulsive categories represents a caricature of logical thinking since isolation does not serve the purpose of objectivity but rather that of defense. In

order to exclude the possibility of surprise, compulsion neurotics have a tendency

to make false generalizations, to classify hastily all ideas into certain mutually exclusive categories and then to get into a state of doubt concerning the nature and evaluation of the categories.

In emphasizing the predilection of compulsives for symmetry, Fenichel draws on the work of Ferenczi and Schilder. All these characteristics of perceptual and of thought processes are seen in the context of such instinctual orientations as ambivalence toward authority and the wish to keep a balance between the id and the superego.

In any application of the multi-layer approach to thinking we are bound to go beyond the face value of the phenomena and to be sensitized to such formal principles as that of the closeness of opposites, hinted at earlier in this paper. This closeness is the direct result of the modification of the original aim by defense mechanisms. Freud himself (34) has dealt with the reversal of instincts into their opposite. He speaks of such changes as the replacement of a passive aim — for example, to be looked at — by an active aim — that is, to look at. The reversal of a content, as found in the change of love into hate, constitutes a similar pattern. Our mental life is seen as governed by three polarities, subject-object, pleasure-pain, activity-passivity, in each of which one pole may be replaced by its opposite.

In my own work on cognition, closeness of opposites could repeatedly be observed. A certain inability to tolerate complex, conflicting, or open structures was observed in the perceptual and cognitive approach of ethnocentric and authoritarian individuals (30). This "intolerance of ambiguity" might, it seemed, be repeated in the more purely emotional sphere in the same manner as it is found in the social area. Ranking our subjects according to their intolerance of emotional ambivalence and their tendency toward perceiving others in terms of positive or negative halos and dichotomies rather than allowing for independent and continuous variability of traits, we attempted to ascertain just how pervasive this intolerance might be. This was done in a number of experiments on memory, concept formation, and perception proper.

Results so far collected support the conjecture that such tendencies as the quest for unqualified certainty, the rigid adherence to the given, the inadequacy of reactions in terms of reality, and so forth, to a certain extent tend to spread between the various areas of personality. It can be demonstrated, further, that such specific forms of reaction as "stimulus-boundness," that is, the pedantic orientation toward concrete detail, tend to reoccur within an individual in contexts seemingly far removed from each other. Inclination toward mechanical repetition of faulty hypotheses, inaccessibility to new experience, satisfaction with subjective and at the same time unimaginative, over-concrete or over-generalized solutions, all appear to be specific manifestations of a general disposition. It seems to matter little whether the authority to which there is submission is that of a person or that of a physical stimulus. In each case the choice seems to be between total acceptance and total rejection; if the two overlap, they do so in different layers of the personality. Avoidance of conscious coexistence of acceptance and rejection which could lead to qualified feelings and statements, and of other complexities is confined to the surface level, however, with chaos lurking behind and breaking through the rigidly maintained façade. With internal conflict being as disturbing as it is in the rigid person, there apparently develops a tendency toward denying external ambiguity as long as such denial can be maintained. The clinging to definite dichotomies and demarcation lines apparently reduces the conflict at the conscious level but at the same time increases the underlying confusion. In the non-authoritarian type of intellect, on the other hand, the total pattern is that of a broader integration of reality; no parts are left out, and thus a more flexible adaptation to varying circumstances is achieved.

It is the lack of integration and the resultant break between the conscious and unconscious layers in the rigid, authoritarian person, as compared with the greater fluidity of transition and of inter-communication between the different personality strata in the more flexible individuals, which appear to have the most far-reaching implications for the respective personality patterns. The shutting out of certain aspects of feelings, and of the inner strata in general, must be seen as the source of the distortion of the external perceptions and judgments. In spite of the recurrence of common elements in various areas, there is no obvious or simple "unity of

style" in this type of personality, at least not so long as we take this term in the sense in which it is used by such typologists as Jaensch (47). At least in part this is the result of the many repressions and of the break between the conscious and unconscious levels discovered and explored by depth-psychology (34). Thus there is a coexistence of such seemingly incompatible opposites as rigid perseverative behavior with an over-fluid, haphazard, disintegrated, random approach, of compulsive over-caution with the tendency toward impulsive shortcuts to action, of chaos and confusion with orderly over-simplification in terms of black-white solutions and stereotypy, of isolation with fusion, of lack of differentiation with the mixing of elements which do not belong together, of extreme concreteness with extreme generality, of cynicism with gullibility, of over-realism with irrationality, of self-glorification with self-contempt, of submission to powerful authorities with resentment against them, and of stress on masculinity with a tendency toward feminine passivity. But it must be remembered that, say, stimulus-boundness, that is, a pedantic orientation toward concrete detail, does as little justice to the problems and principles inherent in any cognitive task as does its opposite, over-generalization. An abstract attitude stressing overall principles is better suited for the penetration of the structure of the concrete and particular data than is exclusive attention to these data in their concreteness. A concentration on the literal meaning of a stimulus datum often entails a distortion of its essential contextual characteristics. The same situation obtains in science where the imaginative, subjective, or intuitive elements with which facts are viewed are of crucial importance for their intellectual mastery.

Styles of thought both in philosophical and scientific thinking must be assumed to be determined by both psychological and social factors. For instance, in psychology an altogether different type of person is usually attracted to the psychoanalytic system from those who show signs of wishing to escape into the palpable, concrete and obvious forms of thinking. Besides the emotional resistance to psychoanalysis, the entire problem of the remoteness from data must be considered here. While some scientists feel safest when they are very close to the data, others feel safest when there is no reference at all to factual data; still others can tolerate the

medium levels of abstraction. Prejudgments of an emotional and cognitive nature enter the picture. The problem of social factors is especially acute now, when we are witnessing a new upsurge of the search for absolutes in the wake of the anxieties and tensions inherent in our time. There can be little doubt that the choice between such philosophical positions as idealism, rationalism, and empiricism is likewise dependent on underlying personality factors. The same may be said for such ethical positions as absolutism, relativism, pessimism, optimism, and so forth.

A further approach to the depth-surface relations which this writer has followed up in some detail is the evaluation of the stories given in response to Murray's Thematic Apperception Test referred to above (54) in the direction of relating the dynamic conflicts to formal characteristics of imagination and thinking. There is evidence that good intellectual organization of the stories often goes with a medium degree of aggression. Underdeveloped aggression tends to impair intellectual penetration and overdeveloped aggression tends to lead to disorganization. The evidence so far collected seems further to suggest that advanced psychosexual development in pre-adolescence, e.g., the prominence of the Oedipal conflict, tends to go with realism and originality, and that the coloring of the personality structure in terms of orality or anality is a further determinant of the formal quality of the production. Thus one of the adolescents under study who had progressed as far as the Oedipal stage but not beyond it and who at the same time still manifested some of the genetically earlier oral traits displayed marked imagination and creativity in the sense of a true grasp of reality, whereas the more purely infantile orality in another boy was accompanied by a sterile type of rumination about the topic of food. Pre-adolescents who are relatively mature in their psychosexual development tend to produce either imaginative fairy-tale-like stories which show creative understanding of real relationships at a symbolic level or very realistic stories which reveal differentiated cognition. Children who display intolerance of ambiguity and are fixated at earlier stages of development tend to display either impoverishment of thought processes or unrealistic stories full of rambling repetition which do not add up to any organized sequence of events. All this is not to say that certain abilities may not develop to a certain degree independently of

instinctual and emotional conflicts. It is not only the drive which must be assumed to determine the fate of ability but also the ability which must be assumed to determine the fate of drive (28).

In conclusion, the vastness of the area of cognition and of imagination in which the contribution of instinctual vicissitudes and of internal mechanisms in general is crucial must not be underestimated, however. The internal dynamisms which psychoanalysis has described mainly in the domain of sex and aggression must be assumed to reach into all fields of psychology, including the seemingly remote one of scientific cognition. Over and above the external observations and the given abilities to organize and to create, our thinking is undoubtedly strongly determined by such defense mechanisms as isolation, repression, displacement, rationalization, and so forth. From our own work we reported interrelations between an ego-alien and not accepted ambivalence toward parental figures, on the one hand, and an intolerance of cognitive ambiguity coupled with rigidity, on the other. Psychosexual development in general seems to be an important determinant of content and quality of imagination. A complete picture of personality must refer to both the pattern of basic motivations and to the manner of manifestation of the motivational tendencies. For prediction we need both depth and surface. While psychoanalysis has been asking, "Which drive?", and general psychology has been asking, "Which effect?", a unified psychology must ask, "Which effect out of which drive?" (28). To a certain extent Allport's (1) principle of "functional autonomy" may hold, that is, there may be partial independence of cognition and social adjustment from genetic and instinctual factors. Emphasis must at the same time be laid upon the interrelationships between the two areas, however, and upon a multi-layer approach to all psychological phenomena. The psychologist may be able to contribute to our insights into these depth-surface relationships considerably beyond what psychoanalysis has developed so far. With an added knowledge of underlying dynamics we will be the better equipped to identify and to integrate over-all organizing principles of overt adjustment. Thus the phenotype is reintroduced without losing sight of dynamic aspects. We must take the detour over the genotype to understand the phenotype. Freud (40) was clearly aware of this fact, and this was the reason why he did not

regard psychoanalysis a closed system. Rather, he conceived of psychoanalysis as needing other types of psychology to complement it:

By itself this science is seldom able to deal with a problem completely, but it seems destined to give valuable contributory help in a large number of regions of knowledge. The sphere of application of psychoanalysis extends as far as that of psychology, to which it forms a complement of the greatest moment.

10. PSYCHOANALYSIS, ETHICS, AND RATIONALITY

Since the true or alleged ethical implications of a scientific theory tend to determine its acceptance and further destiny, any discussion of the scientific involvements of psychoanalysis must remain incomplete without a consideration of its ethical relevance. It has frequently been objected against psychoanalysis — although perhaps more often in the past than in the present — that its orientation is fundamentally unethical and that it aims at the dissolution of morals. Arguments of this kind were raised not only by philosophers in search for a system of absolute, transcendental values but also by empirically oriented social scientists and psychologists of major stature, for example Max Weber (70). According to his wife and biographer, Marianne Weber (71), Weber saw in psychoanalysis an expression of a tendency to loosen up our basic ethical principles. She gives a vivid picture of how they both were impressed by the necessity of the acceptance of ethical norms, laws and obligations, and how disturbed they were by any movement that seemed to challenge this necessity. In this context we find a number of references to Freud. In a long letter written in 1907 Weber had tried to justify his negative attitude toward an article of one of Freud's followers in which reference is made to Freud's system as a psychiatric or "nerves" ethics characterized by the prevalence of the hygienic point of view (71, p. 417). It is essentially the claim, made by some of the followers of Freud, that psychoanalysis represents a new kind of ethics which Weber finds objectionable.

Weber also criticizes the application of psychoanalysis to religion (the major works of Freud on this topic had not yet appeared at that time). Indeed, Freud's predilection for genetic and

biological explanations of social and cultural phenomena including ethics can best be illustrated by his conception of religion. The reader will remember our reference, in the preceding chapter, to the views of Reik on religion which in essence are similar to those of Freud. Freud points out that the search for consolation in the face of threatening feelings of inadequacy and helplessness to which religion provides the answer is nothing new in the life of the individual, since everyone had found himself in a similar situation of helplessness as a child vis-à-vis the parents. The longing for a strong father is seen as closely related to the longing for God. The wisdom and goodness which are attributed to the deity reduce anxiety concerning the dangers of life, and moral order and justice are secured in phantasy even though they may rarely be fulfilled within existing human cultures.

According to Freud the substitution of the scientific spirit for the earlier religious beliefs is a rather complex and long-drawn-out process. Freud favors a purely rational justification of cultural commands as a social necessity. In anticipating objections to this view Freud points to the apparent contradiction between his assumption of the domination of the individual by instincts and passions, on the one hand, and his substitution of reason for emotion as a basis of obedience to culture, on the other. He tries to dispel these anticipated objections by explaining that the intellect is our only means of mastering our instincts, and that in turn mere threats and anxiety are rather ineffectual in the strengthening of intellectual functions. Again we are reminded that the voice of the intellect, though low, does not cease until it is heard.

While Freud tends to explain such social phenomena as religion primarily by reference to dynamics within the individual, most anthropologists and sociologists, notably Durkheim (19) and Max Weber (70), prefer explanations in terms of processes conceived as involving society as a whole. In Durkheim's writings there is an emphasis on respect toward religion as an essential concomitant of respect toward normative rules, customs, and basic values. Religious rituals are seen as an expression of common values and of the moral unity of a society. We may refer to Catlin's remark (in his Introduction to the English translation of Durkheim, 19) that "unlike Freud he (Durkheim) does not make this God a projection of the individual consciousness or nature."

A similar contrast exists between Freud's view that the moral level of a group can only be preserved when the group keeps the characteristics of the individual, and that of Durkheim who assumes that there is nothing moral in the individual as such; it is society in its own right which is possessed of superior moral authority.

To both Durkheim and Weber religion, far from being seen as an illusion or epiphenomenon, appears as a formative factor in social organization. Weber's analysis of the relationships between capitalism and Protestant ethics (70) is but one of the several examples offered by him to illustrate the power of religious ideas. Weber assumes that religious feelings, interests and experiences are worked out differently in different societies; and he is mainly interested in the rational consequences of these religious ideas for social and economic action. Although he gave much attention to an analysis of the rational aspects of organizations like bureaucracy, ultimately this rationality is traced to religious ideas outside of reason.

Both Durkheim and Weber have repeatedly been accused of rationalism albeit the fact that both see the foundations of society in fundamentally non-rational moral qualities. Freud, on the other hand, has been criticized for having given too much prominence to the irrational, while in fact his one hope is the overcoming of the irrational in a society built on reason. Here is an illuminating reversal in the role played by reason when we proceed from the direct verbal formulations made by the authors mentioned to an analysis of the actual function of reason in their theoretical edifices. Freud neglected to explore reason directly and challenged the potency of reason in guiding human conduct. But in his evaluations of the goals of human development he has an exalted esteem for reason, and his understanding for the vicissitudes of unreason has sharpened his grasp for the fundamental nature of reason; in this more crucial respect he is a believer in reason in the best sense of the word. Weber and Durkheim, on the other hand, appear primarily — although by no means exclusively — oriented toward the rational aspects of social conduct. However, one cannot but feel that their grasp of the power potential of reason in human affairs is blunted by an over-rarified idealization of the interplay of rational forces. There is a resulting uneasiness about reason, perhaps not atypical of the twilight of the enlightenment philosophy.

and of the Victorian age; in the end we find group-cohesion and morality seen as hinging upon emotive patterns.

The ultimate recognition of reason by Freud notwithstanding, the original concentration of psychoanalysis on the discovery of the dynamic importance of the primitive, unorganized system of instinctual drives and of their derivatives has led — as was mentioned above — to a far-reaching neglect of consideration for social and interpersonal phenomena. It is largely this diversion of attention from the functions of reason in psychoanalysis which has given the semblance of ethical relativism. Actually, as we have seen, psychoanalysis was so overwhelmed by its epoch-making discovery of the role of irrational forces that the explicit exploration of reasoning processes appeared as the lesser challenge by comparison even though it was reason and not the irrational that held the top spot so far as the evaluative attitude of psychoanalysis is concerned.

Even within all the reservations which psychoanalysis has voiced against an overly naïve rational interpretation of ethics, it merely turns against the assumed major executive principle of the traditional forms of ethics rather than against the basic constructive content of ethics. This particular executive principle is the mechanism of repression. Most pre-psychoanalytic ethical systems assume that socialized behavior is largely dependent upon such inhibitory devices as the looking away from evil, or its denial, or the mastery of its most blatant overt manifestations through strength of will. From psychoanalysis we have learned about the inefficiency and the dangers of these various forms of repression; and we have also understood why emphasis on sainthood and the techniques of the inquisition so often go hand in hand.

As far as both the goals and the effective means of execution of ethics are concerned, psychoanalysis lays stress on the importance of consciousness, integration, and maturity. If we recall for a moment all that is considered an essential ingredient of maturity in psychoanalysis, such as rationality, the overcoming of aggression, the development of cooperativeness, the ability to love and to work, and the courage openly to face inside and outside threats which oppose these characteristics, we readily see that we are confronted with standards which are certainly not lower than those expounded in the traditional systems of ethics. In psychoanalysis,

every neurosis is *ipso facto* considered as failure at satisfactory moral control. The traditional systems of ethics attempted to strengthen consciousness and conscience against the invasion of instincts, and that remains their important historic contribution; however, through psychoanalysis we have become aware of the fact that such strengthening can only be achieved by facing and by working through, rather than by merely condemning, the forces which threaten our conscious personal and social values. From this latter viewpoint, the mortal sin is self-deception, and lack of insight in general, rather than a lack of repression.

It is one of the greatest and least appreciated contributions of psychoanalysis to have seen that for genuinely ethical behavior not only the instincts, so far as antisocial, must be made conscious and integrated into a more encompassing system, but that the major controlling instance of the primordial id-impulses and thus the alleged major guardian of morals, the superego, also may be a source of unconscious sadistic and primitive tendencies. Thus not only the id but also the superego must in the end be subordinated to the more reasonable prescriptions of the ego.

The noxious aspects of the superego derive from the internalized and archaically interpreted or distorted cultural taboos. To use an expression of Fenichel (24), in the superego the ego is confronted with an often "irrational representative of reality." Thus, if the neurotic individual keeps punishing himself for sins he has never actually committed, say, for mere feelings of aggression, a total relativism concerning real social action may easily develop. Unconscious moral tendencies stemming from rigid repressions generally turn out to be unrealistic, unadaptable, infantile, and out of touch with social realities. They represent a mere caricature of moral standards which may become destructive of the individual and of his society. These destructive effects of repression may occur in several different ways, frequently combined with each other. The desired yet unaccepted instinctual impulses may remain split up and unmodified, pushing to return and to break through the brittle defenses. Or an irrational superego may remain ego-alien and non-integrated with the conscious personality, thus perpetuating a pattern of conflict and tensions which may easily undermine the conscious and social intentions of the individual as well as his self-esteem. There may, finally, be a tendency to pro-

ject the guilt stemming from a severe superego onto others; this may lead to the establishment and the persecution of scapegoats in social behavior, or to inequities in the objective appraisal of novel types of approach or theory in scientific behavior.

It hardly needs to be made explicit that rationality cannot be construed to imply amorality and freedom from obligation. On the contrary, genuine ethical behavior involves a comprehension of the issues involved, a facing of all uncertainties and conflicts and of one's own guilt, and a readiness to accept the anguish involved in such an open confrontation. Irrationality and the tendency toward destruction of one's self and of others, on the other hand, are often combined with a short-range over-realism and an orientation toward immediate material benefits. Similarly, steering clear of a compulsive quest for certainty in science does not imply cynicism and morbid doubt. On the contrary, obsession with certainty is a characteristic of irrational problem solutions, and the need for absolutes turns out to be combined with basic disbelief and general distrust.

Some recent writers seem resigned to the fact that only what is irrational, absolute and dogmatic is capable of inciting enthusiasm and of motivating to action, whereas the rational, many-sided approach is seen as inherently inhibitory and as leading to a barren and sterile conception of life or of science. Against this we must hold that individuals who are more open to reason and to facts are in general at the same time those who have a more differentiated internal life and deeper and more reliable — though often relatively calm — emotions. They are at the same time those who, even though less fanatic and less compulsive, show more consistency, conviction and dedication in their principles and ideals. In application to scientific discourse we may stress that extreme or highly obvious positions lend themselves more readily to compact verbal formulation and thus give the false impression of eliminating the perplexities of an unresolved problem situation. Such definite and unqualified statements are especially suited for being put into the service of either very concrete or else excessively general assertions. In the task of the positive formulation of a theory, on the other hand, we must face the difficulties intrinsic in the complexities, ambiguities, flexibilities and less fetching logicalities of the structures at hand, in a manner well exemplified by the stark yet subtle,

daring yet not wayward, policies of psychoanalytic theory construction.

As far as conduct proper is concerned, the distinction between the manifest and the latent, which is one of the most basic achievements of psychoanalysis, provides us with the tools for a differentiation between genuine and spurious ethical behavior, even though the latter may be hidden behind a moralistic façade. But psychoanalysis does much more than that; it also provides us with an understanding of the sources of these forms of behavior, by pointing to their roots in relatively early phases of childhood, notably in the degree and type of identification with the parents and in the conscious or unconscious, hostile or loving, character of the relationship established with them. When Freud says that "what began in relation to the father ends in relation to the community," he may have put his finger on one of the most crucial determinants of our social and moral attitudes. The contribution psychoanalysis has made to a deepened understanding of the ethical behavior of individuals can be expanded into important insights into the historical development of the great systems of ethics. The need for a metaphysical system of absolute values, the insistence on the freedom of will, as well as unbridled relativism and cynicism, are set in their proper context within a system of personal need-dynamics under psychoanalytic scrutiny.

SUMMARY

An appraisal of the scientific legitimacy and operational status of psychoanalytic concepts (Chapters 1, 2, 3, 4) must first consider certain fundamental changes in the views concerning theoretical structure which have taken place within physics itself as the model discipline for the unity of science and for operationism. Both Philipp Frank and Einstein have pointed to the ever-widening gap between observation and theory; there is increasing realization of the fact that the basic concepts and principles of science must be formulated in an abstract, "non-pictorial" language which seems to belie its origin in the world of direct perceptual experience. Much of the seeming absurdity of psychoanalytic assumptions is resolved by setting them side by side with established physical constructs which in many cases are as much in opposition to the

perceptually given as are those of psychoanalysis to the data of manifest, "phenotypical" introspection.

An attempt is made to demonstrate that such basic psychoanalytic concepts as that of the unconscious or of the instinct are either theoretical constructs introduced by postulates, or are concepts defined by reduction-chains. According to Carnap, the latter designate "dispositional predicates." Originally the concepts of the conscious and unconscious signify particular systems possessed of certain dynamic characteristics, calling for a specification of their relationships within the overall formal model. Dreams or subsequent free associations are used for the establishment of intermediate links which can be inserted in the gap between the two systems and with the help of which we can recover the latent material in a process of interpretation.

Freud can be shown to have been familiar with the basic outlook of the philosophy of science. This is evident in his acknowledgement of the fact that the major function of his constructs is the filling out and the integration, in the manner just indicated, of the "exceedingly defective" data of consciousness, as well as in the judiciousness of his use of partially defined or temporarily unspecified hypothetical model-systems. In doing so, Freud stresses that only by means of the assumption of the unconscious can the laws of the conscious processes be established, and that it is this very assumption which enables psychoanalysis to take its place as a natural science. His creative scientific daring is maintained in the face of, and in essential keeping with, the basic requirements of scientific empiricism rather than, as some of his critics would have it, in ignorance of these requirements or in wanton arbitrariness. The far-reaching influence of Helmholtz's physicalism and of the physiology of the late nineteenth century upon Freud has been demonstrated by recent students of the history of psychoanalysis.

While the psychoanalytic system comes closer to a truly scientific theory than most observers realize, psychoanalysis still contains many metaphors, analogies, and confusions between construct and fact which must in the end be eliminated.

The psychoanalytic concept of instinct is complicated by the assumption of far-reaching transformations and disguises, particularly of the sex instinct. But again Freud pursues an essentially operational course when he points to the capacity of the instincts

to "act vicariously for one another" and readily to change their objects. It can be argued that the explanatory value of the instincts lies in this emphasis on the variability of their activity, of which the mechanisms of repression, of reversal into the opposite, or of sublimation are some of the more striking examples. Only in the case of an assumed strict correspondence between instinct and manifest behavior would the concept of instinct become circular or superfluous as an unnecessary duplication of behavior.

When Freud ascribes some of the difficulties in his speculations concerning the instincts to our being obliged to operate with "metaphorical expressions peculiar to psychology" we must add in his behalf that for the type of problems with which psychoanalysis deals the mentalistic (introspectionistic or animistic) vocabulary constitutes the precise counterpart to the pictorial vocabulary which has been stressed as a legitimate or at least tolerable ingredient of the earlier stages of physical science.

One of the most bewildering aspects of psychoanalytic theory is the turning away from the obvious face-value picture of personality as it derives from introspection or from the direct, "phenotypical" observation of external behavior segments. An example is the reinterpretation of overt friendliness as a sign of underlying hostility, or of extreme tidiness as a sign of preoccupation with dirt. The discrepancy disappears with the specification of a set of fixed or variable conditions which determine when overt behavior is to be interpreted as genuine and when as manifesting some heterogeneous latent factor.

Since scientific inference concerning central processes, that is, the assumption of internal states on the basis of external evidence, cannot be defended unless it is based on a wide variety of circumstantial evidence, central inference can be said never to have been legitimately attempted before psychoanalysis. It can be shown that on the negative side of the ledger psychoanalysis, especially in its beginnings, has comparatively de-emphasized both the surface manifestations in their specific identity and, what is more, the so-called distal achievements of behavior. These latter "results" of behavior in turn play the dominant role in such neo-behaviorist systems as that of Tolman. The regrouping of manifest observable facts as undertaken by Freud centers about sameness of "need," that is, sameness of assumed internal cause, while in the case of

Tolman it centers about sameness of effect and in the case of Egon Brunswik's theory of perception it centers about sameness of external object. By virtue of this incompleteness psychoanalysis did not altogether manage to avoid the pitfalls of motivational relativism and of a genetic dissolution of overt adjustmental values. But it must also be stressed that in psychoanalysis we find a legitimate reconstruction of objective causes and not only a pseudo-explanation in terms of subjectively experienced motives as some critics have tried to argue.

It must further be pointed out that the assumption of the dynamisms of the "inner man" to which such behaviorist critics of psychoanalysis as Skinner have objected can be shown to increase the parsimony of the scientific description of behavior patterns. Even more crucial is the fact that these extrapolations from overt behavior help to select the most relevant though often less conspicuous aspects of behavior which otherwise would be lost in the infinite range of possible observation. The relatively great explanatory and predictive value of hypotheses dealing with underlying motivation, which can be demonstrated statistically by means of multiple correlation, may be based on the fact that the selectivity just referred to enters crucially into the formation of these hypotheses. It may be added that from the standpoint of logical analysis there is no alternative but to be behavioristic in any psychological endeavor; neither the so-called subjective phantasies in which psychoanalysis is interested nor any other "introspective" events in others can be constituted except by reference to the manifest physical observation of organisms.

While Feigl places psychoanalysis at the third of the four levels of explanation he distinguishes, thus grouping it together with the relatively descriptive behavior theories of Tolman and Hull, it seems that at least a certain group of psychoanalytic concepts including that of the unconscious goes beyond this level by involving what Reichenbach calls surplus meaning. Using a distinction recently injected into psychological theory by MacCorquodale and Meehl, this group of concepts would seem to be "hypothetical constructs," in contradistinction to the "intervening variables" which are thought of as resting exclusively on the values of a specified set of empirically observed data (Chapter 6). In their own rather sketchy analysis the authors point out that such terms

as libido, censorship, or superego were in psychoanalysis originally introduced as intervening variables, that is, as conventionalized designations of observable properties, but that there frequently was an unnoticed shift toward hypothetical constructs. In their arguments the authors tend to overlook the fact that statements containing intervening variables are by no means exhaustible by statements concerning their observational basis. Both Carnap and Hempel have made it explicit that sentences containing disposition terms cannot be fully translated into sentences about observables. Since we cannot specify all conditions and manners in which latent tendencies become manifest, dispositional statements involve "open" terms and require an infinite series of conditions in order to be tested. The distinction between intervening variables and hypothetical constructs may, in our opinion, nonetheless be retained in a modified form as a gradual one involving different degrees of indirectness of evidence, or different kinds of surplus meaning. Possible relationships to the distinction made by Carnap and Hempel between postulatory theoretical constructs and concepts more directly reducible to observation are pointed out. Guided by some relatively fragmentary initial impressions, Freud seems to have proceeded rather directly to the building of a theoretical structure, with empirical interpretation lagging somewhat behind; in the definition of such theoretical constructs as superego, ego and id the major emphasis is on their structural relations to each other rather than on their relations to observation.

In turning to the problems of the objective verification of specific psychoanalytic hypotheses by means of experiments carried out in the formal tradition of psychology proper (Chapters 5, 7, 8), two types of approach may be distinguished. One, and the more customary of the two, takes its start from the particular hypothetical mechanisms for which psychoanalysis has coined its most salient key-terms. In analogy with an observation made by Frank for the field of physics, the more inferential and abstract parts of psychoanalytic theory, such as the hypotheses on repression, projection, and reaction formation, turn out to be less readily accessible to experimental confirmation than the more descriptive ones, such as those on fixation and regression. Some of the experimental studies have verified even such seemingly far-fetched psychoanalytic assumptions as symbolism.

A second type of approach, one which the present writer has tried to develop for a number of years, concentrates on the principle of alternative manifestations of motivational tendencies. This principle describes the basic pattern of interrelationships between the two strata involved in all psychoanalytic theory, the manifest and the latent, and can be shown to underlie most if not all of the specific mechanisms just mentioned. The possibility of analyzing statistically the tangled relationships between the two strata after imbuing them with some degree of operational independence is illustrated by studies dealing with motivation in its relation to overt behavior segments and with certain mechanisms of self-deception. In the former study a comparison of overall motivational ratings with specific behavioral manifestations is used for a "rational reconstruction" of the cues underlying the so-called intuitive inferences made by the clinicians; the same general procedure would apply in case of the more explicit and more scrutinizing inferences concerning motivational dynamics made by the psychologist as a scientist rather than as a synoptic rater. In the study of self-deception certain formal criteria of distortion, which may take their place alongside the more content-oriented type of diagnostic criteria favored in psychoanalysis proper, were established by means of a semantic analysis of the individuals' responses.

The verification of psychoanalytic hypotheses rests only to a small part on the systematic evidence furnished by academic psychology. Psychoanalysis itself has provided confirmatory empirical data of overwhelming scope, ranging from the wealth of evidence given by individual patients to a synopsis of dream mechanisms, of lapses of tongue and of memory, of pathological symptoms, and of certain relevant features of folklore, myth, and other cultural phenomena.

Regardless of how imperfect psychoanalytic theory may be as to its formal structure, it has no rival among psychological theories as far as the range of both its evidence and its explanatory power is concerned. Learning theory, which is the only other serious contender in such a contest, is equally ambitious in its claim to universality and at the same time more formalized than is psychoanalytic theory. It shares with psychoanalysis the "historical" outlook as well as some basic explanatory principles. But it falls short in accounting for such crucial facts as neurotic inaccessi-

bility to "reinforced" experience which psychoanalysis has so impressively demonstrated and explained, or for the progressive strengthening of the superego in spite of the absence of appropriate reinforcement.

An effort is further made to relate the motivational aspects dealt with in psychoanalysis to certain cognitive problems (Chapter 9). Acceptance of the ambiguous relationship between motivation and manifestation which is the chief discovery of psychoanalysis requires cognitive "tolerance of ambiguity" on the part of the scientist. Relations to the principle of the closeness of opposites, and to the analysis of concretistic, compulsive, and dogmatic patterns of perception and thought by such orthodox psychoanalysts as Fenichel and Reik, are pointed out. The necessary complementarity of the study of motivation and of cognition within a fullfledged system of psychology is elaborated on in its relationship to the complementarity of the depth and the surface approach within the psychology of motivation itself. A more formal aspect of the interrelatedness of the psychology of motivation and of cognition is given by the semantic difficulties arising from the employment of a partly identical nomenclature for the latent and the manifest stratum in common-sense language; as pointed out earlier in the paper, these difficulties are analogous to those arising in the psychology of perception in consequence of the confusion of stimulus and response terminologies as inherited from traditional philosophy.

A concluding section (Chapter 10) deals with the ethically constructive aspects of psychoanalysis. Psychoanalysis combines the genetic reduction of infantile conscience to irrational patterns with a stress on personal maturity and rationality as the adult ethical ideal. Some applications to the problem of the acceptance of scientific theories are made.

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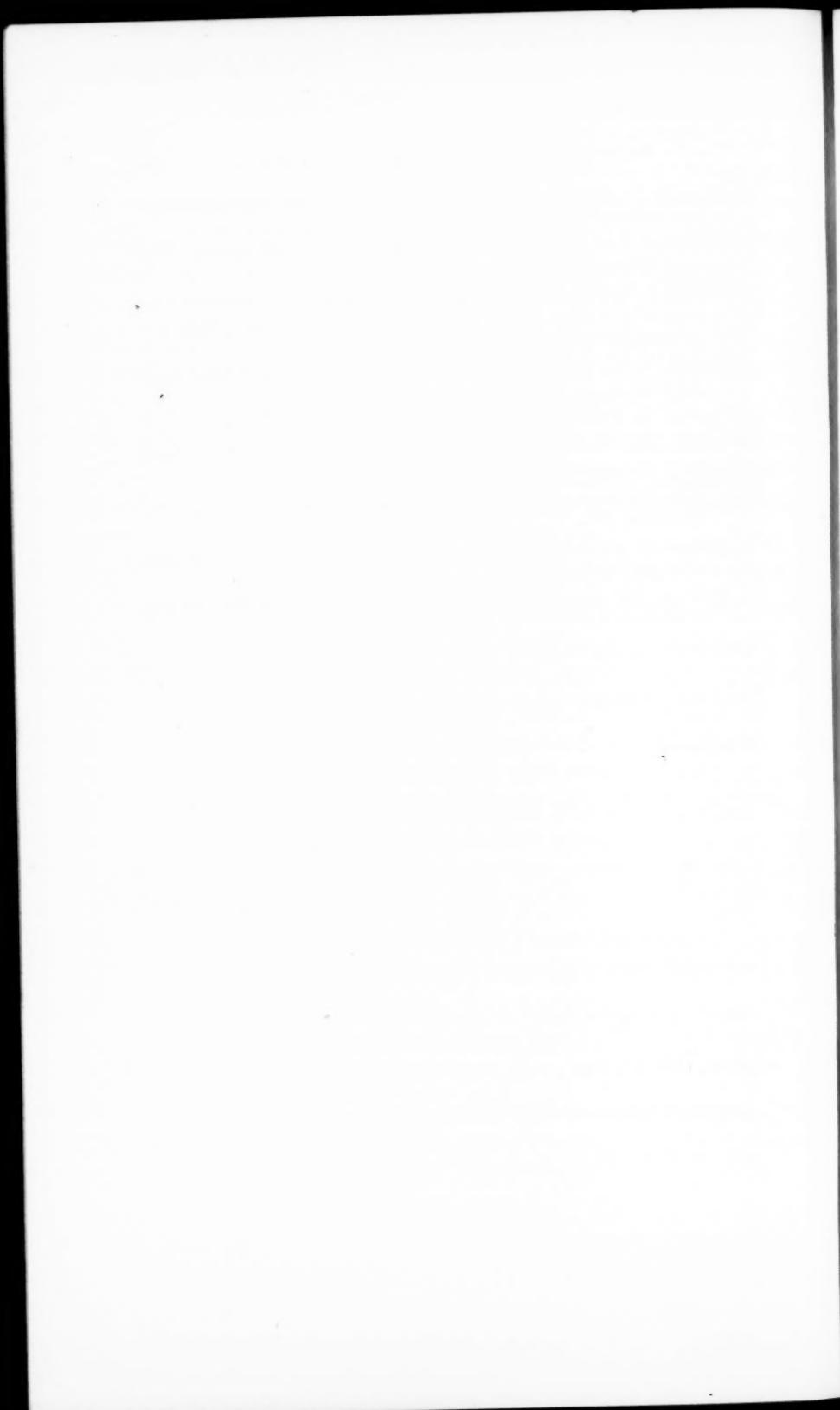
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